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1 Using the I/O Configuration Utility

Chapter Objectives

This chapter explains how to document I/O modules and how to configure a documented module using the I/O configuration utility. Read this chapter first for information on the basic operation of the I/O configuration utility; then read the remaining chapters for information about configuring specific I/O modules.

Note

The I/O configuration utility supports Classic PLC-5 processors and Enhanced PLC-5 processors.

To find information about completing configuration tasks, see NO TAG. To study the keys you can use to move around on any screen in the I/O configuration utility, see Table 1.B.

Table 1.A
Where to Find Information

To:	See:
1. Document module configuration information You can add or copy information about the I/O modules in your system.	1-3 to 1-16
2. Display a list of the modules in your database You can list the documented modules in your system on the I/O System Overview screen.	1-12, 1-17
3. Configure a module You can edit, monitor, or calibrate I/O modules in your system. If you want to: • return to the default configuration values for a module or a channel • check the status or input data of an I/O module in your system • display block transfer data	1-17 to 1-25 • 1-21 • 1-23 • 1-25
4. Delete module records	1-26
5. Capture I/O configuration screens and save them to a file	1-26

Table 1.B
Navigational Keys in the I/O Configuration Utility

	If You Want to:	Press this Key:
	Move to the first field on the screen	[Home]
	Move to the last field on the screen	[End]
To move horizontally:	Move to the preceding field on the line	[left arrow] If this is the first field on the line, move to the last field of the preceding line.
To move horizontally:	Move to the next field on the line	[right arrow] If this is the last field on the line, move to the first field on the next line.
To move horizontally:	Move to the leftmost field on the line	[Ctrl-left arrow]
To move horizontally:	Move to the rightmost field on the line	[Ctrl-right arrow]
To move vertically:	Move straight up to find a field	[up arrow] If there are no fields above this one, move to the bottom of the current page.
To move vertically:	Move straight down to find a field	[down arrow] If there are no fields below this one, move to the top of the current page.
To move vertically:	Move to the top of the current page	[Ctrl-PageUp]
To move vertically:	Move to the bottom of the current page	[Ctrl-PageDown]
To move vertically:	Scroll up one page	[PageUp]
To move vertically:	Go to the preceding screen in a series of screens	
To move vertically:	Scroll down one page	[PageDown]
To move vertically:	Go to the next screen in a series of screens	

Documenting a Module

To document a module:

When using this Instruction:	Perform the following steps:
BT	**1.** In the ladder editor, program the BT instructions for the module. **2.** In the I/O configuration utility, add the module to the I/O configuration database.
CIO	**1.** In the ladder editor, program the CIO instructions for the module (all modules, excluding 1771-SDN and 1794 Flex I/O, on ControlNet™ I/O only). **2.** In the I/O configuration utility, add the module to the I/O configuration database. **3.** In the channel configuration for a ControlNet PLC-5 processor, enter network, device, and I/O mapping information for the module (1771-CFM/A, -IFE/A, -IFE/B, -IFE/C, -IL/A, -IL/B, -IR/A, -IR/B, -IXE/A, -IXE/B, -IXHR/A, -OFE/A, -OFE/B, -VHSC/A, and N-Series modules on ControlNet I/O only); the module is automatically added to the I/O configuration database. **4.** Use the I/O configuration utility to configure a module. See page 1-17. For more information, see “Configuring Channel 2 for ControlNet PLC-5 Processors” in the Software Configuration and Maintenance manual.

For more information on documenting a module, see Figure 1.1. Once you document a module, you can configure the module as often as you want. See Figure 1.2.

Figure 1.1
Documenting a Module

Documenting a Module in the Ladder Editor (Adding a Module to the Database)

In the ladder editor, program the BTW (block transfer write) or CIO Write (ControlNet I/O write) and BTR (block transfer read) or CIO Read (ControlNet I/O read) instructions for the modules you want to document.

Note: Record the control file addresses when you program the BT and CIO instructions so that you can enter these addresses on the Block Transfer Control screen when you are documenting an I/O module. See pages 1-4 to 1-9 for BT and CIO instructions.

On the I/O Module System Overview screen, choose whether to add or copy a module configuration to the database.
See page 1-13.

To Add **To Copy**

On the I/O Module Type Selection screen, choose the type of module to add.
See page 1-15.

On the Block Transfer Control screen, enter the BT (block transfer) or CIO (ControlNet I/O transfer) control data required for your processor.
See page 1-16.
The module is added to the database.

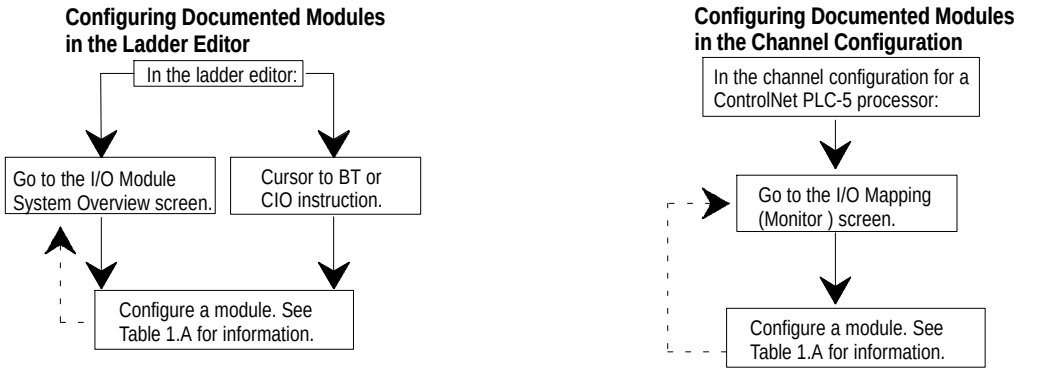
Documenting a Module in the Channel Configuration for a ControlNet PLC-5 Processor (Adding a Module to the Database)

On the Channel Overview screen for a ControlNet PLC-5 processor, select channel 2.

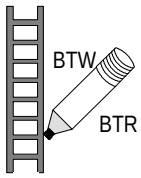
On the ControlNet Node Information (Edit) screen, enter network and device information.
For more information, see "Configuring Channel 2 for ControlNet PLC-5 Processors" in the Software Configuration and Maintenance manual.

On the ControlNet I/O Mapping (Edit) screen, enter I/O mapping information for the devices and the modules.
For more information, see "Configuring Channel 2 for ControlNet PLC-5 Processors" in the Software Configuration and Maintenance manual.
The module is added to the database.

Figure 1.2
Configuring Documented Modules


Configuring Documented Modules in the Ladder Editor
In the ladder editor:
Go to the I/O Module System Overview screen.
Cursor to BT or CIO instruction.
Configure a module. See Table 1.A for information.
Configuring Documented Modules in the Channel Configuration
In the channel configuration for a ControlNet PLC-5 processor:
Go to the I/O Mapping (Monitor) screen.
Configure a module. See Table 1.A for information.

Guidelines for Programming BT and CIO Instructions in the Ladder Editor



You must program the BT or CIO instructions for a module before you can add the module to the database. Program these instructions in the ladder editor.

Note *For more information about programming block transfers or ControlNet I/O transfers, see the Instruction Set Reference manual. See the appropriate user manual for a particular module to look at sample ladder programs for that module.*

All BT instructions for a module must have the same rack-group-module address; all CIO instructions for a module must have the same node-slot address. Also, the rack-group-module address (when using BT instructions) or the node-slot address (when using CIO instructions) for a new module must not be the same as the rack-group-module address (BT) or node-slot address (CIO) for another module already documented on the same processor. Some modules require more than one BTW or CIO Write instruction and BTR or CIO Read instruction. (See Table 1.E.)

Note *Record the control file addresses when you program the block transfers and ControlNet I/O transfers so that you can enter these addresses on the Block Transfer Control screen when you are documenting an I/O module.*

Table 1.C
Required BT or CIO Data for Modules Requiring One BTW or CIO Write and One BTR or CIO Read (except N-Series: see Table 1.D)

This Module:	Requires a BTW or CIO Write with these Lengths (in words): [1, 2]	And a Default Length of: [2]	And Requires a BTR or CIO Read with these Lengths (in words): [1, 2]	And a Default Length of: [2]
1771-CFM/A	1, 2, 3, 4, 14, 24, 34, 44, 48, 52, 56, or 60	60	3, 4, 5, 14, 23, 32, or 41	41
1771-IFE/A and 1771-IFE/B	3-37	37	5-20	20
1771-IFE/C	3-39	37	5-22	20
1771-IL/A	3-19	19	5-12	12
1771-IL/B	3-37	19	5-15	12
1771-IR/A	3-14	14	3-8	8
1771-IR/B [3]	3-15	14	3-9	8
1771-IXE/A	3 27	27	4-12	12
1771-IXE/B [3]	3-28	27	4-13	12
1771-IXHR/A [3]	3-28	27	4-13	12
1771-SDN/A [4]	64	64	64	64
1791-N4C2/A [5]	3-27	27	1-5	5
1791-N4V2/A [5]	3-27	27	1-5	5
1771-OFE/A and 1771-OFE/B	5 or 13	13	5	5
1771-VHSC/A [6]	1, 2, 4, 12, 20, 24, 29, 34, 39, 44, 49, 54, 59, or 64	64	1-26	18
1794-IE4XOE2/A and 1794-IE4XOE2/B [4]	1-10	10	1-5	5
1794-IE8/A and 1794-IE8/B [4]	1-6	6	1-9	9
1794-IR8/A [4]	4	4	11	11
1794-IT8/A [4]	4	4	11	11
1794-OE4/A and 1794-OE4/B [4]	1-14	14	1	1

[1] The software inserts the default lengths for these instructions if you specify 0 (BT only).
[2] These lengths are also valid when documenting a module from the channel configuration for ControlNet PLC-5 processors.
[3] Full length BTW or CIO Write and BTR or CIO Read instructions must be specified explicitly to calibrate the module.
[4] The 1771-SDN and the 1794-IE4XOE2, -IE8, -IR8, -IT8, and -OE4 modules cannot use CIO instructions on ControlNet I/O.
[5] These modules are not supported using scheduled I/O with ControlNet PLC-5 processors.
[6] If you want to read any totalizer values contained in words 19-26, you must specify the BTR or CIO Read length explicitly.

Table 1.D
Required BT and CIO Data for N-Series[1, 2] Analog Modules

An N-Series Module With:					
The Number of Output Channels:	**And the Number of Input Channels:**	**Requires a BTW or CIO Write with these Lengths (in words): [3]**	**And a Default Length of:**	**And a BTR or CIO Read with these Lengths (in words): [3]**	**And a Default Length of:**
0	8	1, 3, 10, 17, 24, 31, 38, 45, 52, or 59	59	28	28
1	7	1, 2, 4, 10, 17, 24, 31, 38, 45, 52, or 59			
2	6	1, 2, 3, 5, 11, 17, 24, 31, 38, 45, 52, or 59			
3	5	1, 2, 3, 4, 6, 12, 18, 24, 31, 38, 45, 52, or 59			
4	4	1, 2, 3, 4, 5, 7, 13, 19, 25, 31, 38, 45, 52, or 59			
5	3	1, 2, 3, 4, 5, 6, 8, 14, 20, 26, 32, 38, 45, 52, or 59			
6	2	1, 2, 3, 4, 5, 6, 7, 9, 15, 21, 27, 33, 39, 45, 52, or 59			
7	1	1, 2, 3, 4, 5, 6, 7, 8, 10, 16, 22, 28, 34, 40, 46, 52, or 59			
8	0	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 17, 23, 29, 35, 41, 47, 53, or 59			
0	4	1, 3, 10, 17, 24, or 31	31	20	20
1	3	1, 2, 4, 10, 17, 24, or 31			
2	2	1, 2, 3, 5, 11, 17, 24, or 31			
3	1	1, 2, 3, 4, 6, 12, 18, 24, or 31			
4	0	1, 2, 3, 4, 5, 7, 13, 19, 25, or 31			

[1] 1771-NBRC, -NBSC, -NBTC, -NBVC, -NBV1, -NB4S, -NB4T, -NIS, -NIV, -NIVR, -NIVT, -NIV1, -NOC, -NOV, -NR, -NT1, -NT2, -NX1, -NX2, -NX3, -NX4 modules

[2] All N-Series modules can be added to the I/O configuration database from the channel configuration.

[3] The software inserts the default lengths for these instructions if you specify 0 (BT only).

Guidelines for Programming Multiple BT or CIO Instructions

If a module requires multiple BT or CIO instructions, enter the following BTW or CIO Write and BTR or CIO Read instructions in the order shown below on the Block Transfer Control screen. Enter these instructions in any order in the ladder editor.

Table 1.E
Required BT or CIO Data for Modules Requiring Multiple BTWs or CIO Writes and BTRs or CIO Reads

This Module:	Requires BTW or CIO Write Number:	With this Length (in words): [1]	And a Default Length of: [1]	And Requires BTR or CIO Read Number:	With this Length (in words): [1]	And a Default Length of: [1]
1400-PB/A and 1400-PD/A	1: Device setup	43	43	1: Device setup	43	43
	2: Setpoint configuration	2	2	2: Setpoint setup	11	11
	3: Setpoint setup	11	11	3: Voltage/current parameters	44	44
	4: Time setup	7	7	4: Power parameters	63	63
	5: Control request	12	12	5: Status parameters	38	38
	6: PLC written parameters	6	6	6: Diagnostic parameters	19	19
1402-LS51/A	1: Factory configuration	35	35	1: Factory configuration parameters	35	35
	2: User configuration	12	12	2: User configuration parameters	12	12
	3: Control request	14	14	3: Acknowledge factory configuration	25	25

[1] Full length BTW or CIO Write and BTR or CIO Read instructions must be specified explicitly to calibrate the module.

(Continued)

This Module:	Requires BTW or CIO Write Number:	With this Length (in words): [1]	And a Default Length of: [1]	And Requires BTR or CIO Read Number:	With this Length (in words): [1]	And a Default Length of: [1]
1402-LS51/A				4: Acknowledge user configuration	15	15
				5: Synchronization bus error parameters	18	18
				6: Synchronization bus voltage/current parameters	46	46
				7: Synchronization bus power parameters	54	54
				8: Reference bus voltage parameters	26	26
				9: Diagnostic parameters	24	24

[1] Full length BTW or CIO Write and BTR or CIO Read instructions must be specified explicitly to calibrate the module.

When you finish entering information, press **[F10]** **Accept** to validate and save the information.

Block Transfer Example Disk

A block transfer example disk containing archive files and ASCII ladder listing and data table reports is also included with your 6200 programming software. Use this disk to view block transfer programming examples for certain module types. The following table summarizes the control file types and names.

Control File Type:	Name:	Control File Type:	Name:	Control File Type:	Name:
Block Transfer	ASCII2	Block Transfer	IL	Integer	CFM_MOD
Block Transfer	DB_PLC5	Block Transfer	IR	Integer	DR_MASK
Block Transfer	DCM_PLC5	Block Transfer	IXE	Integer	FLEX_OE4
Block Transfer	DE_PLC5	Block Transfer	LI	Integer	FLEXCOMB
Block Transfer	DR_SETID	Block Transfer	OFE	Integer	NSERIES
Block Transfer	DRREAD	Block Transfer	QA_1AXIS	Integer	PD
Block Transfer	FLEX_IE8	Block Transfer	SN_RACK1	Integer	QB_IAXIS
Block Transfer	IFE	Block Transfer	VHSC5BAS	Integer	QC_2AXIS
Block Transfer	IJ_IK	Block Transfer	VHSC5ONS		

Install the example disk the same way you installed the 6200 programming software, i.e., **Install** *drive* **[Enter]**. You should have already installed 6200 programming software. Install the example disk to the same drive that you installed the 6200 programming software. For more information on installation procedures, see chapter 1 in the Configuration and Maintenance manual.

Use the arrow keys to select the group of examples that you want to install from those listed on the installation screen. All options except the report only option copy both the archive files and the reports. See the following table for more information.

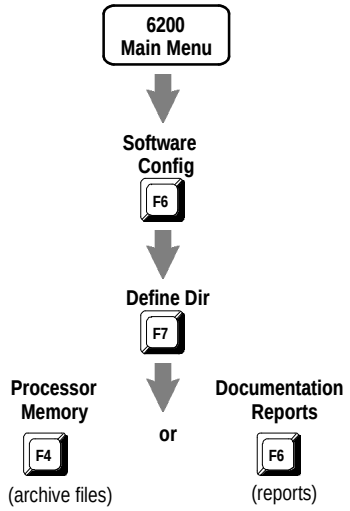
Selecting this:	Installs Examples for these Modules:	Using this Amount of Storage (in bytes) on the Hard Drive:
.LIS and .DTR only	ladder listing report and data table report	220K
ANALOG	1771-IFE, 1771-IL, 1771-IR, 1771-IXE, N-Series analog, 1771-OFE	137K
DATA	1771-DA, 1771-DB, 1771-DCM, 1771-DR, 1771-SN	199K
MOTION	1771-DE, 1771-IJ, 1771-IK, 1771-QA, 1771-QB, 1771-QC, 1771-VHSC	201K
PID	1771-LI, 1771-PD	52K
ALL	archive files for all of the above modules	589K

Note

Allen-Bradley I/O modules are highly flexible and configurable. These examples do not cover every possible configuration. Evaluate the suitability of these examples for your application carefully. You will need to modify the values and comments to integrate them into your application; see the documentation provided with the modules.

These Options:	Are Installed in this Directory:
the archive files	\IPDS\ARCH\PLC5\AB_EXAMP
the reports	\IPDS\LIS\PLC5\AB_EXAMP

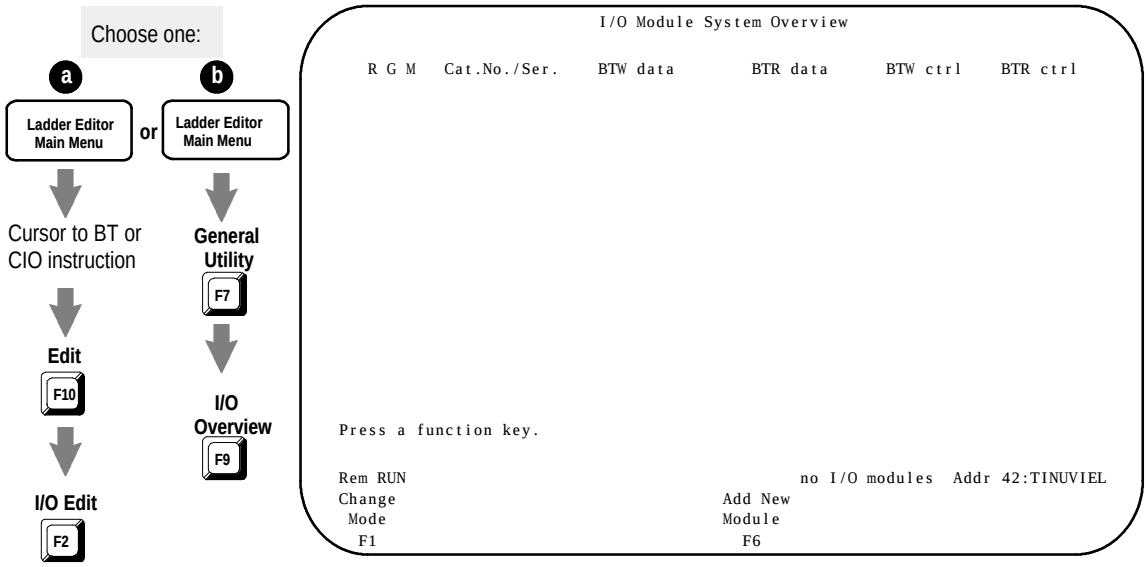
Access the archive files and reports by changing the directory. To do this, follow these steps:



If you want to copy the example files to a different drive or directory, go to DOS and copy them to the drive or directory you choose.

Starting the I/O Configuration Utility

To start the I/O configuration utility, follow the steps on the left.



If you have not documented any modules yet, the I/O Module System Overview screen appears with only two function keys:
[F1] Change Mode and **[F6] Add New Module**.

If You Want to:	Press this Key:
Change the processor mode	[F1] Change Mode
Document a new module (add a module record to the system)	[F6] Add New Module
Copy the configuration of a documented module (if you have previously documented modules)	[F8] Copy
Return to the Ladder Editor	[Esc]

Tip

If you used the PLC-5 standalone I/O configuration utility *for N-Series modules (prior to release 4.4), and are now using the same processor name, the I/O configuration utility merges these modules into the I/O configuration database. This happens automatically when you first enter the I/O configuration utility from the ladder editor.*

During this merge, a message states that your module list is being merged into the 6200 database. The software edits the module list for you by adding the modules that you had configured using the standalone utility to the module list previously configured using the I/O configuration utility. Save your edits before exiting 6200 programming software or the modules from the I/O standalone configuration utility will disappear from your module list.

Adding a Module to the Database

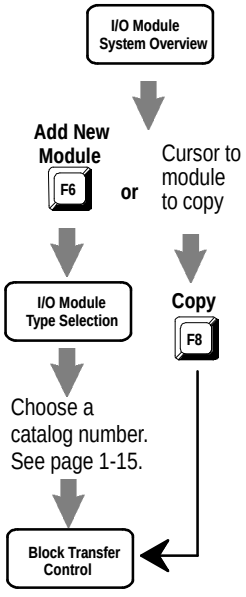
You can add a module to the database in two ways:

- add a new module by pressing **[F6] - Add New Module**
- copy the configuration from an existing module by cursoring to it and pressing **[F8] - Copy**.

Follow the guidelines in the table below to decide which option to choose.

Note

If you do not have any I/O modules configured, the ***[F8] - Copy*** *key is not available.*



If You Want to Add:	Press this Key:
the first module of a given type	[F6] Add New Module If you press [F6] Add New Module, you need to choose the type of module to add on the I/O Module Type Selection screen. See page 1-15 for information about choosing a module type. After you choose a module type, you must enter block transfer or ControlNet I/O transfer control information for the module. See page 1-16.
a module with a configuration very different from modules of the same type previously added	
a module you've already started to configure using data monitor in the ladder editor	
a module with the same or a similar configuration to a module of the same type previously added **Note:** The BTW or CIO Write and BTR or CIO Read lengths that you programmed for the new module must be identical to the lengths that you programmed for the existing module.	[F8] Copy After you press [F8] Copy, enter block transfer or ControlNet I/O transfer control information for the new module. See page 1-16. The I/O configuration utility copies the selected existing module's configuration to the BTW or CIO Write data table for the new module. To edit the copied configuration, press [F2] Edit.

Example: If you want to configure two 1771-IL modules slightly differently, configure the first IL module and then copy that configuration and edit it to suit the configuration of the second IL module. If you want to configure two 1771-IL modules very differently, or to configure two modules of different types (e.g., a 1771-IL and a 1771-IFE), then add each new module separately.

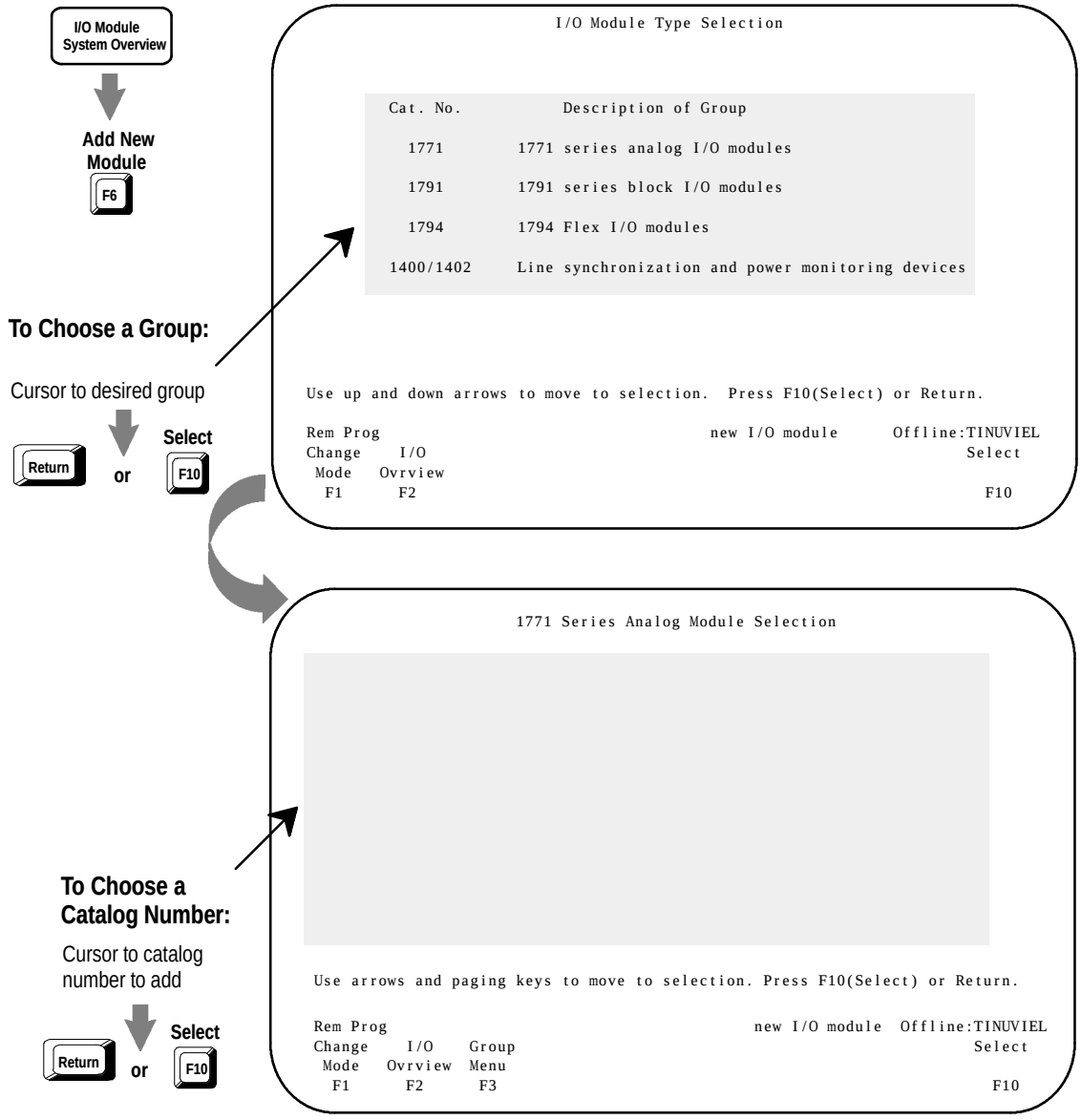
Note

The I/O configuration entries in the database may not remain synchronized with the ladder program. For example, if you program block transfer instructions at a rack-group-module address of 2-3-1 and add the module in the I/O configuration utility, the database record is written with a key of 2-3-1. If you edit the ladder program and change the BT instructions to 3-0-0, the I/O configuration utility displays the correct rack-group-module address of 3-0-0 because this information is read from the BT control files. But, if you attempt to add a new module at 2-3-1, an error message displays that an I/O module is already located at that r-g-m and the module is not added to the database.

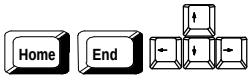
To avoid this database discrepancy, you must delete the changed module from the I/O Configuration Module Overview screen and then add the module by pressing ***[F6] - Add New Module****.*

Choosing a Module Type (Catalog Number)

When you add a new module, select a module group and catalog number on the I/O Module Type Selection screen. To do this, follow the steps on the left.

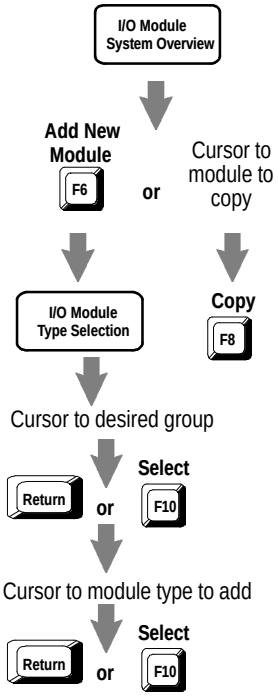


Entering Block Transfer or ControlNet I/O Transfer Control Information



These are the only navigational keys active on the Block Transfer Control screen.

Enter the block transfer or ControlNet I/O transfer control information described in the table below on the Block Transfer Control screen. You should have recorded this data when you programmed your BT or CIO instructions in the ladder editor.




```
                          Block Transfer Control

1771 IFE Series B

                              Module Address:    001 00

                            Control block      Data table         length

          Write address     CT21:50            N7:0                10

          Read address      CT21:60            N7:1                20



Please enter Control Block address.
>
Rem Prog                                      new I/O module  Offline:TINUVIEL
Change    I/O                                 Display                 Accept
 Mode   Ovrview                               Symbols
  F1      F2                                    F7                     F10
```

On the Block Transfer Control screen, enter information in the following fields:

In this Field:	Enter this Information:
Control block Write address Read address	Enter the block transfer or ControlNet I/O transfer control file addresses for each BT or ControlNet I/O transfer instruction. These addresses must be identical to the BTW and BTR or CIO Write and CIO Read control file addresses in your ladder logic. You **do not** have to enter the data table addresses, lengths, or module addresses (block transfer) or rack-group-module addresses (ControlNet I/O transfer) on this screen. The I/O configuration utility reads the actual BT or ControlNet I/O transfer control files from the processor to get this information for you.

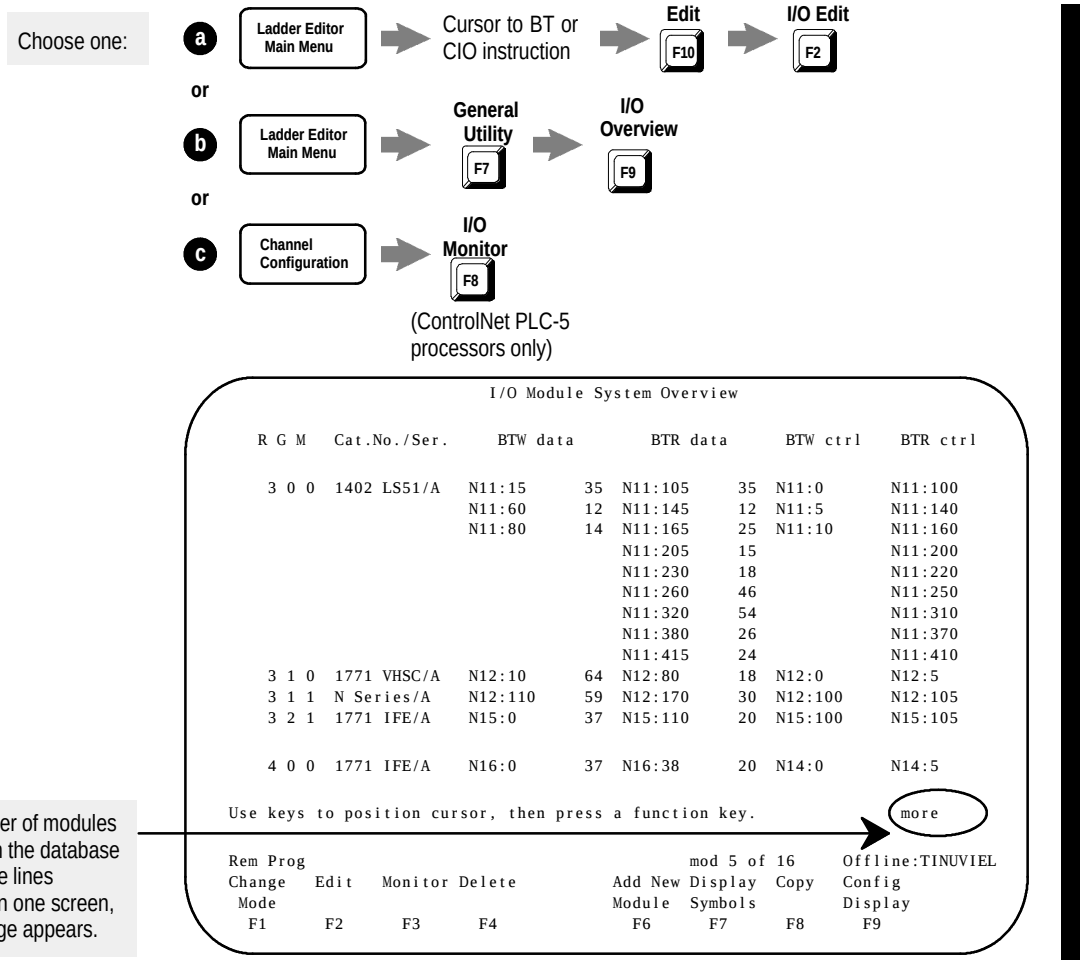
Press **[F10] - Accept**, and the software returns to the I/O Module System Overview screen. See page 1-17 for information on configuring the module.

Note

When you add a new N-Series module to the database, the I/O configuration utility may prompt you to choose a specific catalog number after you have entered information on the Block Transfer Control screen. If this happens, see page 3-1.

Configuring a Module

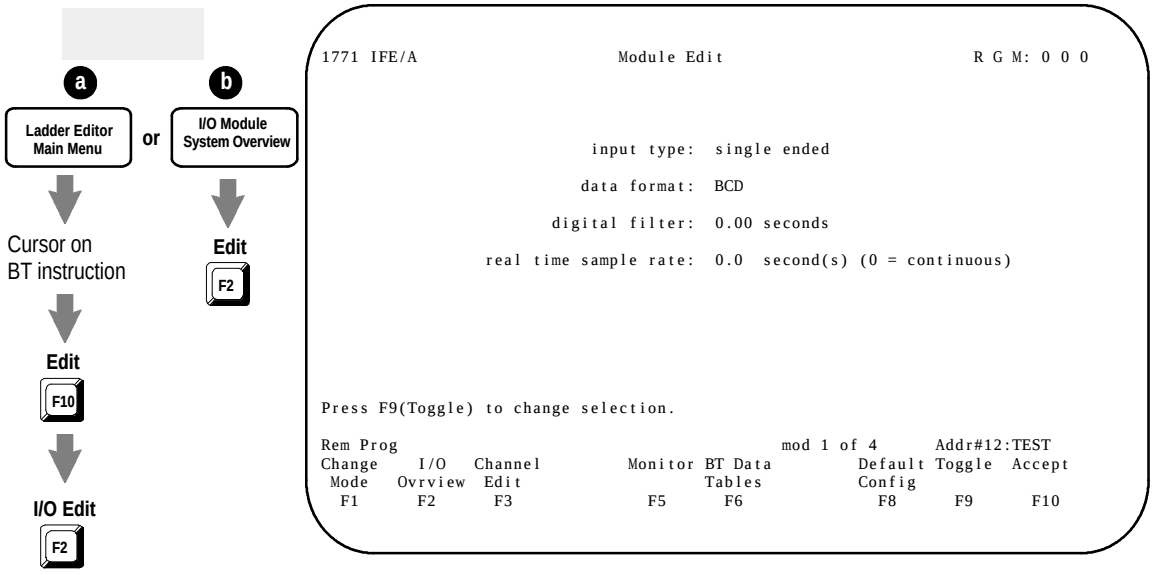
After you have added a module to the I/O configuration database, you can edit, monitor, or calibrate it as often as you want. Do this by selecting a module to configure from the ladder editor or the I/O Module System Overview screen.


Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Edit
F10
I/O Edit
F2
or
b
Ladder Editor Main Menu
General Utility
F7
I/O Overview
F9
or
c
Channel Configuration
I/O Monitor
F8
(ControlNet PLC-5 processors only)
I/O Module System Overview
R G M Cat.No./Ser. BTW data BTR data BTW ctrl BTR ctrl
3 0 0 1402 LS51/A N11:15 35 N11:105 35 N11:0 N11:100
N11:60 12 N11:145 12 N11:5 N11:140
N11:80 14 N11:165 25 N11:10 N11:160
N11:205 15 N11:200
N11:230 18 N11:220
N11:260 46 N11:250
N11:320 54 N11:310
N11:380 26 N11:370
N11:415 24 N11:410
3 1 0 1771 VHSC/A N12:10 64 N12:80 18 N12:0 N12:5
3 1 1 N Series/A N12:110 59 N12:170 30 N12:100 N12:105
3 2 1 1771 IFE/A N15:0 37 N15:110 20 N15:100 N15:105
4 0 0 1771 IFE/A N16:0 37 N16:38 20 N14:0 N14:5
Use keys to position cursor, then press a function key.
more
If the number of modules you have in the database exceeds the lines available on one screen, this message appears.
Rem Prog mod 5 of 16 Offline:TINUVIEL
Change Mode F1
Edit F2
Monitor F3
Delete F4
Add New Module F6
Display Symbols F7
Copy F8
Config Display F9

If You Want to:	Press this Key:
Change processor mode	[F1] Change Mode
Change the configuration of a module	[F2] Edit
Monitor status data and the configuration of a module	[F3] Monitor
Delete the documentation for a module (module record). This does not change the BTR or CIO Read and BTW or CIO Write data files and control files.	[F4] Delete
Add a module record to the database	[F6] Add New Module
Display symbols (if defined) or display only addresses **Note:** The I/O configuration utility does not support symbols that are wider than 10 characters; if you enter symbols wider than 10 characters, the display is truncated to the first 10 characters.	[F7] Display/Suppress Symbols
Copy the configuration of a documented module	[F8] Copy
Change display options • Select how to order the configured modules on the screen. The default is sort by rack-group-module. • Select whether to display all BTs or CIOs or just the first BTW or CIO Write and BTR or CIO Read for each module. (Only these modules have more than one BTW or CIO Write and one BTR or CIO Read: 1400-PB, 1400-PD, and 1402-LS51.) The default displays all BTs or CIOs.	[F9] Config Display You See: • [F3] Sort by Rack [F4] Sort by Cat. No. • [F7] All BTW/BTR [F8] First BTW/BTR
Select the previous or next module	[up arrow] or [down arrow]
Select the first or last module in the list	[Home] or [End]
Select the first or last module on the current page	[Ctrl-PageUp] or [Ctrl-PageDown]
Show the next or previous page of modules	[PageDown] or [PageUp]
Return to the ladder editor	[Esc]

Editing a Module

When you edit a module, you change the BTW or CIO Write data associated with the module, accept those changes, and then initiate the write block transfer or write ControlNet I/O transfer to the I/O module. The following example shows the Module Edit screen for a 1771-IFE module using BT instructions. Other modules have different edit and setup screens with slightly different function keys. Follow the steps on the left.



I/O modules may have several edit or setup screens (e.g., module edit, channel edit.)

If You Want to:	Press this Key (if available):
Change processor mode	[F1] Change Mode
Return to the System Overview screen	[F2] I/O Overview [Esc]
Move to other edit screens for a module. (Exact function of these keys varies for different module types.)	[F3], [F4]
Monitor the module's data and status	[F5] Monitor
Display block transfer configuration and input data and status information • Display data in octal format • Display data in decimal format • Display data in Hex/BCD format	[F6] BT Data Tables On all Block Transfer Data screens: [F6] Change Radix. You see: • [F2] Octal Data • [F3] Decimal Data • [F4] Hex/BCD Data
Return to the the default configuration values for the module	[F8] Default Config/Other Functns See "Applying Default Values" on page 1-21.
Cycle through available options for a data field. Press this key repeatedly until the option you want appears.	[F9] Toggle
Accept your edits and write the data to the processor	[F10] Accept/Review Errors See page 1-21.

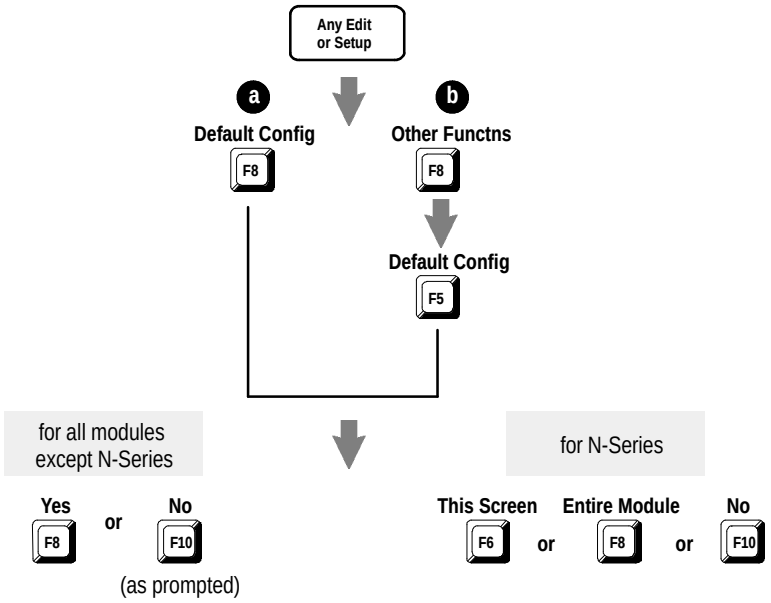
The I/O configuration utility supports navigational keys that you can use to move around on any screen in the utility. See Table 1.B on page 1-2.

When you change information on edit or setup screens, pending edits appear below the current values. These edits are not saved until you press **[F10] Accept**. We suggest that you edit all screens for a module before you accept edits. See page 1-21.

If the processor is in Run mode, the processor might be changing a BTW or CIO Write data file while you are editing the same data file with the I/O configuration utility. The software updates the configuration utility screens continuously to show changes in the BTW or CIO Write data file from the processor. These changes replace old field values on monitor screens, and do not appear as pending edits.

Applying Default Values

While editing, you can return to the default values for a module. To re-establish defaults, follow these steps:



Accepting Edits

If **[F10] Accept** does not appear as an option, **[F10] Review Errors** appears in its place. The Review Errors option helps you to correct configuration mistakes by listing errors. When you correct these errors, **[F10] Accept** appears.

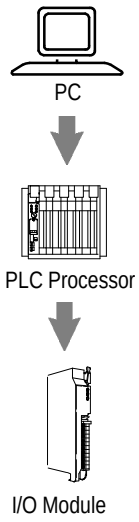
When you press **[F10] - Accept**, the I/O configuration utility merges your edits with the latest version of the BTW, CIO Write, or scheduled I/O data file from the processor. The I/O configuration utility then writes the merged file to the PLC. Because it takes time to read data from the processor and to perform the merge, if your program continuously changes the output data files, the I/O configuration utility may miss some updates.

Note

The execution of the BTW or CIO Write instruction in your ladder program occurs automatically if the processor is in Run mode. If the software initiates a block transfer or ControlNet I/O transfer request and the processor is not in Run mode, as soon as the processor is switched to Run mode, the BTW or CIO Write instruction is automatically executed.

The execution of Scheduled I/O data transfers in your channel configuration for ControlNet PLC-5 processors occurs automatically.

When you press **[F10] - Accept**, the following occurs:



The system asks you to verify that you want to write the pending edits from all screens to the database files and to the processor data table.

IF YOU ANSWER:

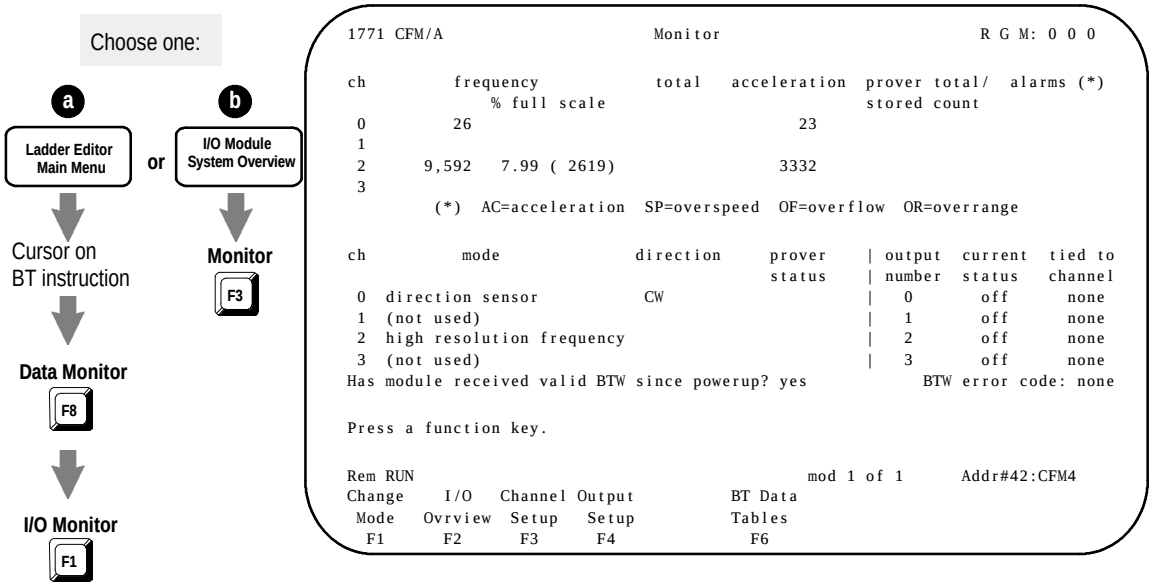
YES	NO
1. Pending edits are written to the processor data table. **2**. If you are connected to a processor, the system asks you to verify that you want to initiate a block transfer or ControlNet I/O transfer of the data to the processor. If you answer yes when using BT instructions, the software adjusts the BTW control file to execute a BTW the next time that BTW instruction is scanned in Run mode; if you answer yes when using CIO instructions, the ControlNet I/O transfer takes place immediately. **3**. The pending edits become current on your screen.	Changes are not made.

Note

The procedure for accepting edits to the configuration of 1400-PB and 1400-PD devices differs in that you can accept edits for individual screens or all screens. See chapter 5 for specific information.

Monitoring a Module

To monitor the data and status of a module, start on the monitor screen(s). The information on the monitor screen(s) varies according to module type. The following example shows the Monitor screen for a 1771-CFM/A module using BT instructions. Follow the steps on the left.


Choose one:
a
Ladder Editor Main Menu
or
b
I/O Module System Overview
Cursor on BT instruction
Monitor
F3
Data Monitor
F8
I/O Monitor
F1
1771 CFM/A Monitor R G M: 0 0 0
ch frequency % full scale total acceleration prover total/ stored count alarms (*)
0 26 23
1
2 9,592 7.99 (2619) 3332
3
(*) AC=acceleration SP=overspeed OF=overflow OR=overrange
ch mode direction prover status | output number | current status | tied to channel
0 direction sensor CW | 0 off none
1 (not used) | 1 off none
2 high resolution frequency | 2 off none
3 (not used) | 3 off none
Has module received valid BTW since powerup? yes BTW error code: none
Press a function key.
Rem RUN mod 1 of 1 Addr#42:CFM4
Change Mode F1
I/O Ovrview F2
Channel Setup F3
Output Setup F4
BT Data Tables F6

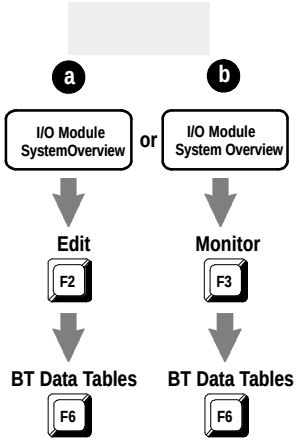
Note

Monitor screens display the contents of the BTR or CIO Read file in the processor's data table. The I/O configuration utility depends on your ladder program to execute BTR or CIO Read instructions that update the BTR or CIO Read data. If the processor is in Program or Test mode, or if your ladder logic disables the rung containing the BTR or CIO Read instruction, the data shown on the monitor screen may be different from the data actually sensed by the module and the status actually reported by the module. If the BTR or CIO Read is shorter than the maximum length the software will display only the data contained in the actual BTR or CIO Read length.

If You Want to:	Press this Key (if available):
Change processor mode	[F1] Change Mode
Return to the System Overview screen	[F2] I/O Overview [Esc]
Move to edit screens for a module. (Exact function of these keys varies for different module types.)	[F3] [F4]
Display Block Transfer configuration and input data and status information • Display data in octal format • Display data in decimal format • Display data in Hex/BCD format	[F6] BT Data Tables On the Block Transfer Data screen: [F6] Change Radix You see: • [F2] Octal Data • [F3] Decimal Data • [F4] Hex/BCD Data
Display symbols (if defined) or display only addresses **Note:** The I/O configuration utility does not support symbols that are wider than 10 characters; if you enter symbols wider than 10 characters, the display is truncated to the first 10 characters.	[F7] Display/Suppress Symbols
Move through the various monitor screens (Some modules have only one monitor screen.)	[PageUp] [PageDown]

Displaying Block Transfer or ControlNet I/O Transfer Data

Use the Block Transfer Data screen to display an image of the processor data tables for a module without returning to the ladder editor to use the data monitor function. This example shows the Block Transfer Data screen for a 1771-CFM module using BT instructions. Follow the steps on the left.




```
1771 CFM/A                  Block Transfer Data                    R G M: 0 0 0

            Configuration Data (BTW)                    Input Data/Status (BTR)

  N7:10      8192     0     0    772     0      N7:100     8192      0
                                                 N7:102      772    128
  N7:15         0     0     0   4000     0      N7:104      128      0
                                                 N7:106        0     44
  N7:20         0     0     0      0     0      N7:108        0      0
                                                 N7:110        0      1
  N7:25         0     0     0      0     0      N7:112        0      0
                                                 N7:114        0      0
  N7:30         0     0     0      0     1      N7:116        0      0
                                                 N7:118        0      0
  N7:35       100     0     0   4000     0      N7:120        0      0
                                                 N7:122        0   4393
  N7:40         0     0     0      0     0      N7:124        1   6090
                                                 N7:126       40   6718

Press arrow keys or PgUp/PgDn to see more data.

Rem RUN                                          mod 1 of 1      Addr#42:CFM4
Change     I/O   Channel Output  Monitor Change  Display
 Mode    Ovrview  Setup   Setup           Radix   Symbols
  F1       F2      F3      F4      F5      F6      F7
```

You cannot edit the information on this screen.

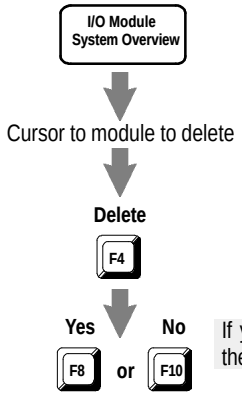
If You Want to:	Press this Key (if available):
Change processor mode	[F1] Change Mode
Return to the I/O Overview screen	[F2] I/O Overview [Esc]
Move to edit screens for a module. (Exact function of these keys varies for different module types.)	[F3], [F4]
Monitor the module	[F5] Monitor
Choose a format in which to display block transfer or ControlNet I/O transfer information • Display data in octal format • Display data in decimal format • Display data in Hex/BCD format	[F6] Change Radix You See: • [F2] Octal Data • [F3] Decimal Data • [F4] Hex/BCD Data
Display symbols (if defined) or display only addresses **Note:** The I/O configuration utility does not support symbols that are wider than 10 characters; if you enter symbols wider than 10 characters, the display is truncated to the first 10 characters.	[F7] Display/Suppress Symbols

Deleting Module Documentation

To remove a module record from the I/O configuration utility database, follow these steps:

Note

Modules added to the I/O configuration utility from the Channel 2 Configuration screens for ControlNet can be deleted from the Channel 2 Configuration screens only; you cannot delete these modules from the I/O configuration utility.



If you specify no, the module remains on the I/O Module System Overview screen.

If you specify yes, the system deletes the module record. The corresponding block transfer or CIO instructions in the program, the BTW or CIO Write and BTR or CIO Read control files, and the BTW or CIO Write and BTR or CIO Read data files remain unaltered.

Capturing Screens

You can capture I/O configuration screens and save them to a file from anywhere in the utility by pressing **[Ctrl-Z]**. The screens are appended to a single screen dump file named SCREEN.DMP in the default documentation report directory (**\IPDS\LIS\PLC5**). You can use DOS commands such as `print` to print these files.

2 Configuring Analog I/O Modules (Other than N-Series Analog I/O Modules)

Chapter Objectives

This chapter explains how to configure analog I/O modules. You should have already read chapter 1 because it explains the basic functions and screens you'll use.

Configuring an Analog I/O Module

When you edit a module configuration, you can change the BTW or CIO Write data associated with a module, accept those changes, and then initiate the block transfer or ControlNet I/O transfer.

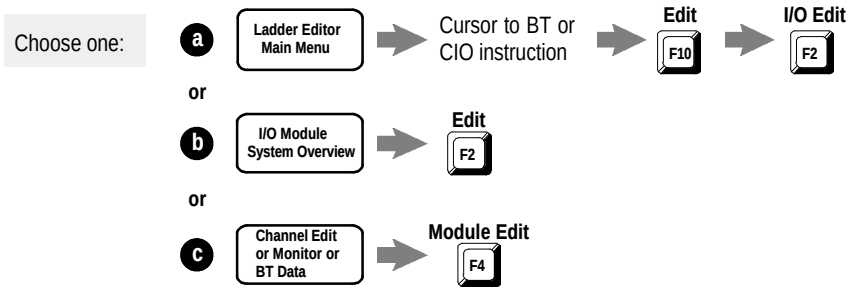
Editing Module Configuration

For Information about Configuring this Module:	See Page:
1771-IFE/A, 1771-IFE/B, and 1771-IFE/C	2-2
1771-IL/A	2-8
1771-IL/B	2-13
1771-IR/A and 1771-IR/B	2-19
1771-IXE/A and 1771-IXE/B	2-27
1771-IXHR/A	2-35
1771-OFE/A and 1771-OFE/B	2-43
1771-SDN/A	2-48

Configuring 1771-IFE Series A, Series B, and Series C

To configure a 1771-IFE series A, series B, or series C module, follow the steps below.

Module Edit Screen 1771-IFE



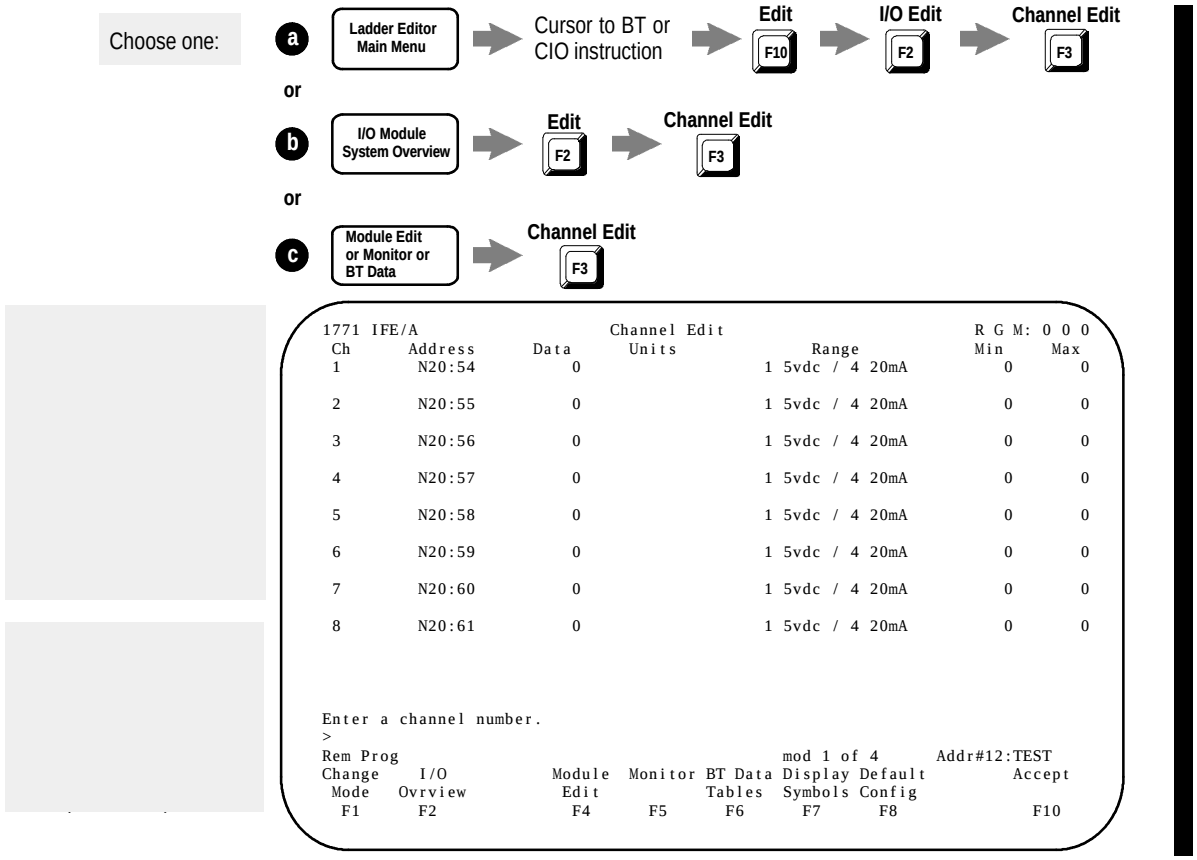
If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

```
1771 IFE/A                    Module Edit                    R G M: 0 0 0


                          input type:  single ended

                         data format:  BCD

                      digital filter:  0.00 seconds

                real time sample rate:  0.0  second(s) (0 = disabled)




Press F9(Toggle) to change selection.

Rem Prog                                        mod 1 of 4      Addr#12:TEST
Change     I/O    Channel          Monitor BT Data          Default Toggle  Accept
 Mode    Ovrview  Edit                    Tables             Config
  F1       F2      F3                F5      F6               F8      F9      F10
```

Field:	Valid Values:
Input Type	Press [F9] Toggle to select Single-ended or Differential. The default is Single-ended.
Data Format	Press [F9] Toggle to select Binary Coded Decimal (BCD), Twos Complement Binary or Signed Magnitude Binary. The default is BCD.
Digital Filter	Enter a value between 0.00 and 0.99 seconds. The default is 0.00.
Real Time Sample Rate	Enter a real-time sample rate between 0.1 and 3.1 seconds; enter 0 for disabled. The default is 0.0.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 1771-IFE


Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Edit
F10
I/O Edit
F2
Channel Edit
F3
or
b
I/O Module System Overview
Edit
F2
Channel Edit
F3
or
c
Module Edit or Monitor or BT Data
Channel Edit
F3
1771 IFE/A Channel Edit R G M: 0 0 0
Ch Address Data Units Range Min Max
1 N20:54 0 1 5vdc / 4 20mA 0 0
2 N20:55 0 1 5vdc / 4 20mA 0 0
3 N20:56 0 1 5vdc / 4 20mA 0 0
4 N20:57 0 1 5vdc / 4 20mA 0 0
5 N20:58 0 1 5vdc / 4 20mA 0 0
6 N20:59 0 1 5vdc / 4 20mA 0 0
7 N20:60 0 1 5vdc / 4 20mA 0 0
8 N20:61 0 1 5vdc / 4 20mA 0 0
Enter a channel number.
>
Rem Prog mod 1 of 4 Addr#12:TEST
Change I/O Module Monitor BT Data Display Default Accept
Mode Ovrview Edit Tables Symbols Config
F1 F2 F4 F5 F6 F7 F8 F10

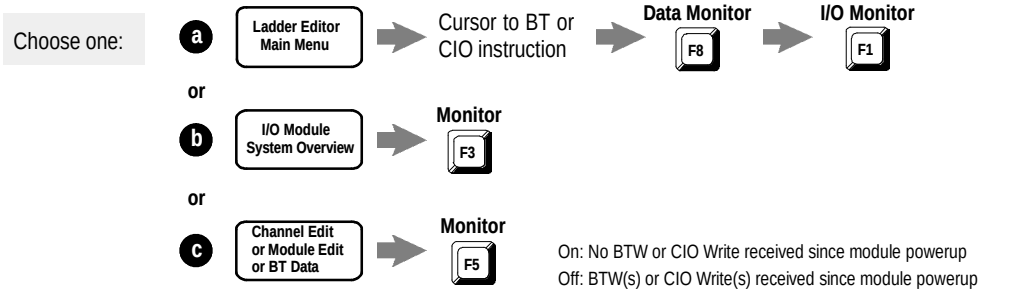
Field:	Valid Values:
Channel	Index number of a valid channel. Enter 1 to 16 to move to the line for that channel or use the arrow keys or [PageUp] or [PageDown].
Address	Displays the logical address of the value in the Data field (display only). Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays data from the module. The data is read from the module's BTR or CIO Read data file. The data in this field cannot be edited on this screen (display only). If the processor is not in Run mode, the data reflects input values the last time a BTR or CIO Read was performed.
Units	Enter a word or phrase that describes the type of channel data (up to 10 characters) or press [F9] Toggle to make a choice.
Range	Press [F9] Toggle to select the valid ranges for each channel. The choices are: • 1-5 V dc / 4-20 mA (default) • 0-5 V dc / 0-20 mA • ± 5 V dc / ± 20 mA • ± 10 V dc / 0-10 V dc
Min and Max	Lets you change the scaling values for each channel. Valid values for Min are 9999 to the value in the max field. Valid values for Max are the value in the min field to 9999. If Min and Max are both 0 for all 16 channels, then the module applies default scaling to all channels. Default values depend on range selection for each channel. If you choose 1-5 V dc / 4-20 mA or 0-5 V dc / 0-20 mA for the range, default scaling is 0-4095. If you choose ± 5 V dc / ± 20 mA or ± 10 V / 0-10 V dc for the range, default scaling is 4095 to +4095.

Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-IFE Series A, Series B, and Series C

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen - 1771-IFE




```
1771 IFE/C                          Monitor                          R G M: 0 0 0

                 Write BT    Read BT                          Power up Bit: OFF
Control File:    N10:0       N20:0                              Range Status: normal
   Data File:    N10:50      N20:50                           Scaling Status: normal
      Length:    37          20                  Real Time Sample Status: normal
                                                              EEPROM Status: ok

Ch   Address    Data    Units    Status  Ch   Address    Data    Units    Status

 1    N20:54        0            normal   9    N20:62        0            normal
 2    N20:55        0            normal  10    N20:63        0            normal
 3    N20:56        0            normal  11    N20:64        0            normal
 4    N20:57        0            normal  12    N20:65        0            normal
 5    N20:58        0            normal  13    N20:66        0            normal
 6    N20:59        0            normal  14    N20:67        0            normal
 7    N20:60        0            normal  15    N20:68        0            normal
 8    N20:61        0            normal  16    N20:69        0            normal



Press a function key.

Rem Prog                                          mod 1 of 4      Addr#12:TEST
Change     I/O    Channel Module          BT Data Display
 Mode    Ovrview  Edit    Edit            Tables  Symbols
  F1       F2      F3      F4               F6      F7
```

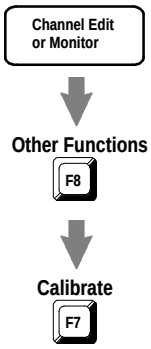
Field:	Valid Values:
Write BT	Control and data file addresses and length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and length for the BTR or CIO Read instruction.
Power-up Bit	ON or OFF to indicate whether or not the module powered up successfully.
Range Status	If there is a range error, ERROR; otherwise NORMAL.
Scaling Status	If there is a scaling error, INVALID; otherwise NORMAL.
Real Time Sample Status	If there is an RTS error, TIMEOUT; otherwise NORMAL.
EEPROM Status	If the new calibration values cannot be stored in memory, FAILED; otherwise, OK.
Channel	Index number of the valid channel.
Address	Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays online data from the module. The data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	Displays a word or phrase that describes the type of channel data.
Status	Whether the channel data is Normal, Overrange, or Underrange.

Auto-Calibrating 1771-IFE Series C

You must be connected to a processor to calibrate a module. To calibrate a 1771-IFE series C module, follow the steps on the left.

Auto Calibration Screen 1771-IFE Series C only

In order to access the auto calibration function, you must specify the maximum lengths for the BTW or CIO Write (15) and BTR or CIO Read (9) fields in your ladder program.



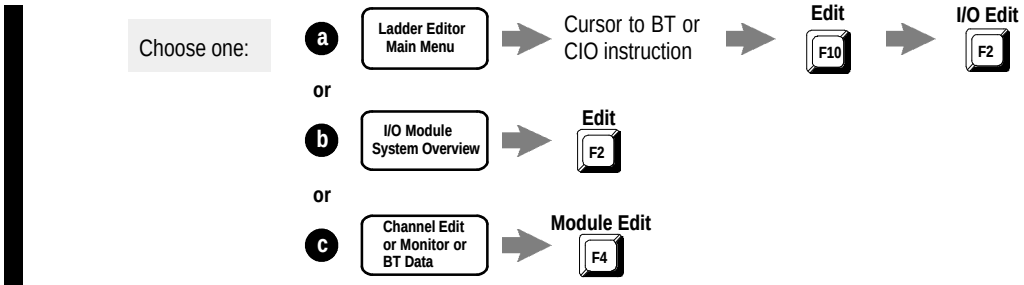

```
1771 IFE/C                  Auto Calibration                    R G M: 02 1-0

    Calibration Status:  ok                    EEPROM Status:  ok

                              Offset Calibration Requests
          1   2   3   4   5   6   7   8   9   10  11  12  13  14  15  16
 offset?  no  no  no  no  no  no  no  no  no  no  no  no  no  no  no  no

 status:  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok

                              Gain Calibration Requests
          1   2   3   4   5   6   7   8   9   10  11  12  13  14  15  16
   gain?  no  no  no  no  no  no  no  no  no  no  no  no  no  no  no  no

 status:  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok  ok

Press F9(Toggle) to change selection.

Rem Prog                                        mod 7 of 7      File TEST
Change    I/O    Channel Module  Monitor BT Data                Toggle  Accept
 Mode   Ovrview  Edit    Edit            Tables
  F1      F2      F3      F4      F5      F6                     F9      F10
```

1. Set the Offset Calibration Requests to yes.
2. Apply a precision voltage of 0.000 V to all selected input channels.
3. Press this key, then press **[F8]** **Yes** twice, as it appears.
4. Set the Gain Calibration Requests to yes.
5. According to the input range for each channel, apply the correct precision voltage to all selected input channels. If you have a range of 1-5V dc, 0-5 V dc, or ± 5 V dc, apply 5 V; if you have a range of ± 10 V dc, apply 10 V; if you have a range of 4-20 mA, apply 20 mA.
6. Repeat step 3.
7. Set the Gain Calibration Requests to no.
8. Repeat step 3.

Configuring a 1771-IL Series A

To configure a 1771-IL series A module, follow the steps below.

Module Edit Screen 1771-IL/A



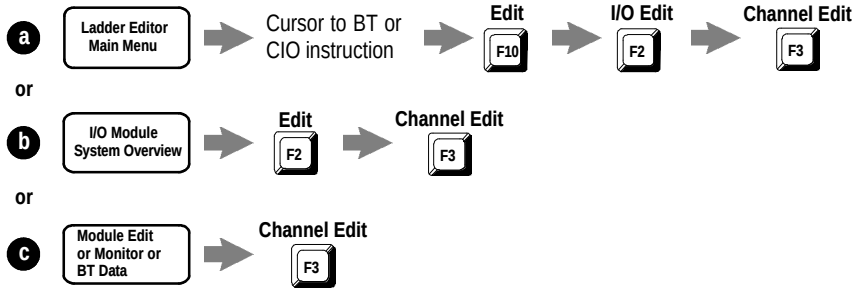

```
1771 IL/A                    Module Edit                          R G M: 1 1 0


                          data format:  BCD

                 real time sample rate:   .0  second(s) (0 = disabled)









Press F9(Toggle) to change selection

Rem Prog                                          mod 5 of 6      Addr#12:TEST
Change     I/O    Channel          Monitor BT Data          Default Toggle  Accept
 Mode    Ovrview  Edit                    Tables            Config
  F1       F2       F3               F5       F6              F8      F9      F10
```

Field:	Valid Values:
Data Format	Press [F9] Toggle to select Binary Coded Decimal (BCD), Signed Magnitude Binary, or Twos Complement Binary. The default is Binary Coded Decimal.
Real Time Sample Rate	Enter a real-time sample rate between 0.5 and 3.1 seconds; enter 0 for disabled. The default is 0.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 1771-IL/A

Choose one:




```
1771 IL/A                    Channel Edit                          R G M: 1 1 0
 Ch      Address      Data      Units              Range            Min      Max
 1       N100:54         0                  1 5vdc / 4 20mA          0        0

 2       N100:55         0                  1 5vdc / 4 20mA          0        0

 3       N100:56         0                  1 5vdc / 4 20mA          0        0

 4       N100:57         0                  1 5vdc / 4 20mA          0        0

 5       N100:58         0                  1 5vdc / 4 20mA          0        0

 6       N100:59         0                  1 5vdc / 4 20mA          0        0

 7       N100:60         0                  1 5vdc / 4 20mA          0        0

 8       N100:61         0                  1 5vdc / 4 20mA          0        0



Enter a channel number.
>
Rem Prog                                    mod 5 of 6      Addr#12:TEST
Change     I/O          Module  Monitor BT Data Display Default          Accept
 Mode    Ovrview          Edit          Tables  Symbols Config
  F1       F2             F4      F5      F6      F7      F8              F10
```

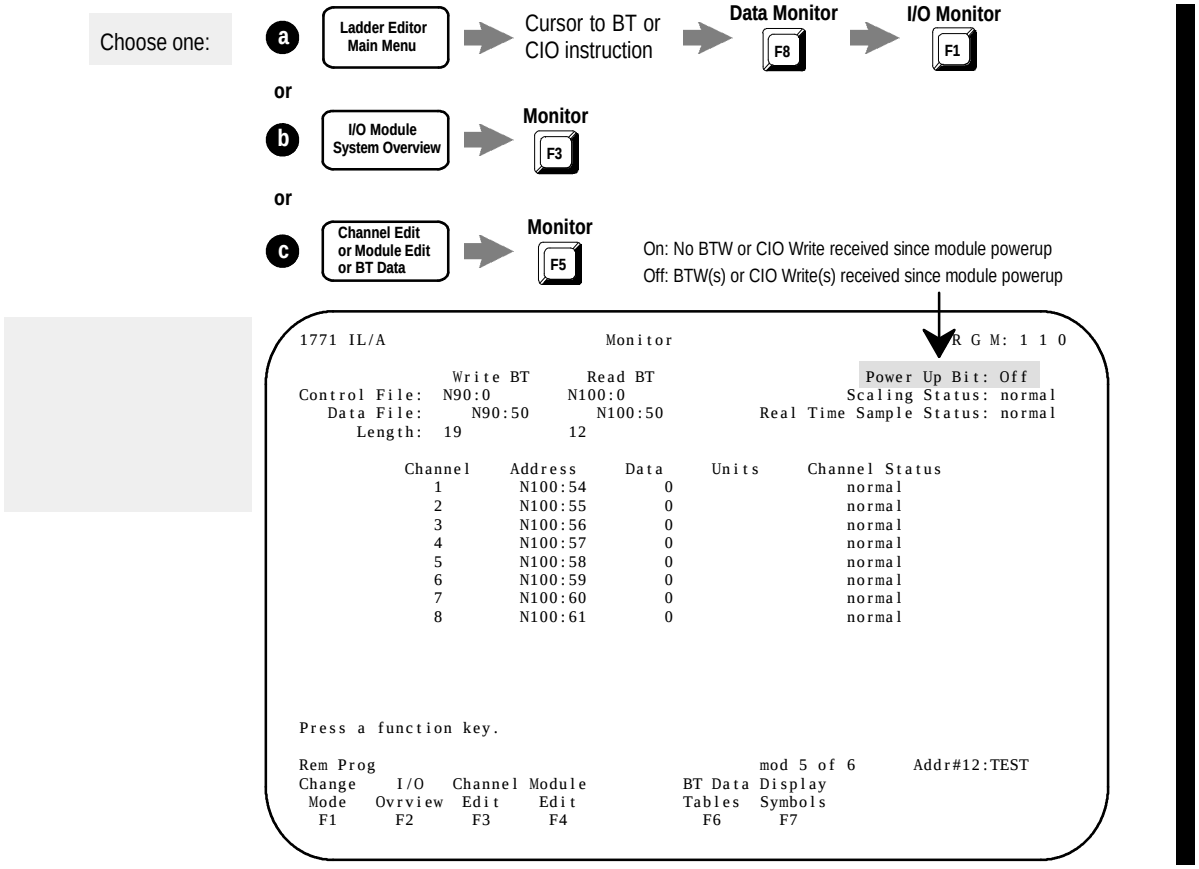
Field:	Valid Values:
Channel	Index number of a valid channel. Enter 1 to 8 to move to the line for that channel, or use the arrow keys.
Address	Displays the logical address of the value in the Data field (display only). Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays data from the module. The data is read from the module's BTR or CIO Read data file. The data in this field cannot be edited on this screen (display only). If the processor is not in Run mode, the data reflects input values the last time a BTR or CIO Read was performed.
Units	Enter a word or phrase that describes the type of channel data (up to 10 characters), or press [F9] Toggle to make a choice. The I/O configuration utility only saves units currently in use by the module on the Channel Edit screen.
Range	Press [F9] Toggle to select the valid ranges for each channel. The choices are: • 1-5 V dc / 4-20 mA (default) • 0-5 V dc / 0-20 mA • ± 5 V dc / ± 20 mA • ± 10 V dc / 0-10 V dc
Min and Max	The minimum scaling value for each channel. Default scaling is 0-4095 if you choose 1-5 V dc / 4-20 mA or 0-5 V dc / 0-20 mA for the range, and ±4095 if you choose ± 5 V dc / ± 20 mA or ± 10 V / 0-10 V dc for the range.

Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-IL Series A

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1771-IL/A



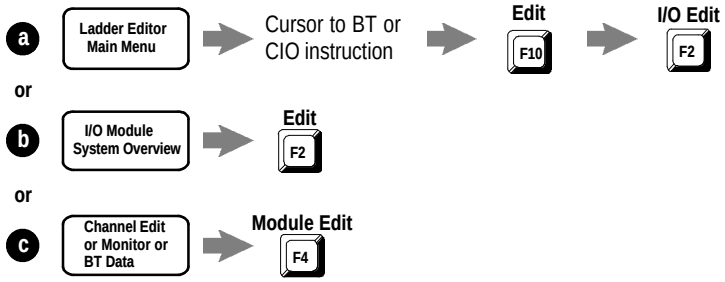
Field:	Valid Values:
Write BT	Control and data file addresses and length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and length for the BTR or CIO Read instruction.
Power-up Bit	ON or OFF to indicate whether or not the module powered up successfully.
Scaling Status	If there is a scaling error, INVALID; otherwise NORMAL.
Real Time Sample Status	If there is a RTS error, TIMEOUT; otherwise NORMAL.
Channel	Index number of the valid channel.
Address	Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays online data from the module. The data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	Displays a word or phrase that describes the type of channel data.
Channel Status	Whether the channel data is Normal, Overrange, or Underrange.

Configuring 1771-IL Series B

To configure a 1771-IL series B module, follow the steps below.

Module Edit Screen 1771-IL/B

Choose one:



If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

```
1771 IL/B                    Module Edit                          R G M: 03 2 0




              data format for read BT:  BCD

             data format for write BT:  BCD

                real time sample rate:   .0 s (0 = disabled)

              digital filter constant:  .00 s (0 = no filter)




Press F9(Toggle) to change the module's format for reporting data.

Rem Prog                                          mod 1 of 1      Offline:DRILL
Change     I/O    Channel          Monitor BT Data          Default Toggle  Accept
 Mode    Ovrview  Edit                     Tables           Config
  F1       F2       F3               F5       F6             F8       F9       F10
```

Field:	Valid Values:
BTR Data Format	Press [F9] Toggle to select a data format. The choices are: BCD (Binary Coded Decimal), Signed Magnitude Binary, and Twos Complement Binary. The default is BCD.
BTW Data Format	Press [F9] Toggle to select a data format. The choices are: BCD and Twos Complement Binary. The default is BCD.
Real Time Sample Rate	Type a value for the real-time sample rate. The valid range is 0.1 to 3.1 seconds in 0.1 second increments. Type 0 to disable real-time sampling. The default is 0.
Digital Filter Time Constant	Type a value for the digital filter time constant. The valid range is 0.00 to 0.99 (BCD) or 0.0 to 2.55 (binary) seconds. Type 0 to disable the digital filter. The default is 0.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 of this manual for more information.

Channel Edit Screen 1771-IL/B

Choose one:

a. Ladder Editor Main Menu → Cursor to BT or CIO instruction → Edit (F10) → I/O Edit (F2) → Channel Edit (F3)

or

b. I/O Module System Overview → Edit (F2) → Channel Edit (F3)

or

c. Module Edit or Monitor or BT Data → Channel Edit (F3)

```
1771 IL/B                        Channel Edit                          R G M: 03 2 0
Ch    Data      Units              Range          Min/Max Scale    Lo/Hi Alarm
 1       0                  1 5vdc / 4 20mA        0      0        0      0

 2       0                  1 5vdc / 4 20mA        0      0        0      0

 3       0                  1 5vdc / 4 20mA        0      0        0      0

 4       0                  1 5vdc / 4 20mA        0      0        0      0

 5       0                  1 5vdc / 4 20mA        0      0        0      0

 6       0                  1 5vdc / 4 20mA        0      0        0      0

 7       0                  1 5vdc / 4 20mA        0      0        0      0

 8       0                  1 5vdc / 4 20mA        0      0        0      0


Enter a channel number.
>
Rem Prog                                          mod 1 of 1      Offline:DRILL
Change    I/O          Module  Monitor BT Data          Default  Toggle  Accept
 Mode   Ovrview          Edit           Tables          Config
  F1      F2             F4      F5      F6              F8       F9      F10
```

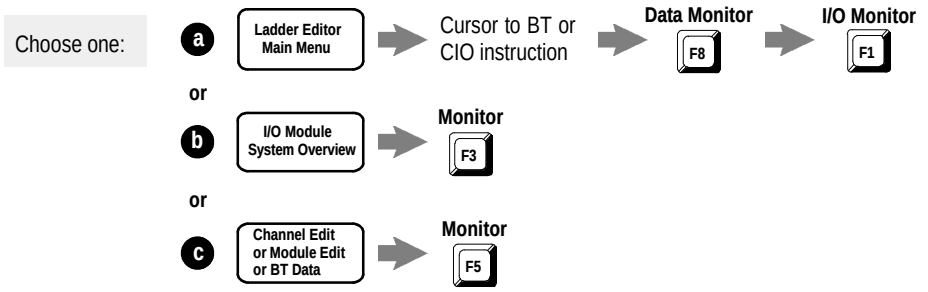
Field:	Description:
Channel	Index number of a valid channel. Enter 1 to 8 to move to the line for that channel, or use the arrow keys.
Data	Displays data from the module. The data is read from the module's BTR or CIO Read data file. The data in this field cannot be edited on this screen (display only). If the processor is not in Run mode, the data reflects input values the last time a BTR or CIO Read was performed.
Units	Enter a word or phrase that describes the type of channel data (up to10 characters), or press [F9] Toggle to make a choice. The I/O configuration utility only saves units currently in use by the module on the Channel Edit screen.
Range	Press [F9] Toggle to select the valid ranges for each channel. The choices are: • 1-5 V dc / 4-20 mA (default) • 0-5 V dc / 0-20 mA • ± 5 V dc / ± 20 mA • ± 10 V dc / 0-10 V dc
Min/Max Scale	The minimum and maximum scaling value. The valid range is ±9999 (BCD) or 32768 to +32767 (binary). The minimum scaling value must be less than the maximum scaling value. The default is 0 (no scaling).
Lo/Hi Alarm	The low and high alarm limit. The valid range is ±9999 (BCD) or 32768 to +32767 (binary). To disable alarms, set both limits to zero. The default is 0 (alarms disabled).

Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 of this manual for more information.

Monitoring 1771-IL Series B

Use the Monitor screen to verify the configuration data. Follow the steps below.

Monitor Screen 1771-IL/B




```
1771 IL/B                          Monitor                          R G M: 03 2 0

                Write BT      Read BT          valid BTW since power up? yes
Control File:   N10:5         N10:0            latest BTW configuration: valid
   Data File:   N11:10        N11:0                  real time sampling: normal
      Length:   19            12                           fuse status: ok

    Channel     Address      Data     Units     Channel Ranges  Channel Alarms

       1        N11:4          0                  normal
       2        N11:5          0                  normal
       3        N11:6          0                  normal
       4        N11:7          0                  normal
       5        N11:8          0                  normal
       6        N11:9          0                  normal
       7        N11:10         0                  normal
       8        N11:11         0                  normal


Press a function key.

Rem Prog                                          mod 1 of 1      Offline:DRILL
Change     I/O   Channel Module          BT Data Display
 Mode    Ovrview  Edit    Edit           Tables  Symbols
  F1       F2      F3      F4              F6      F7
```

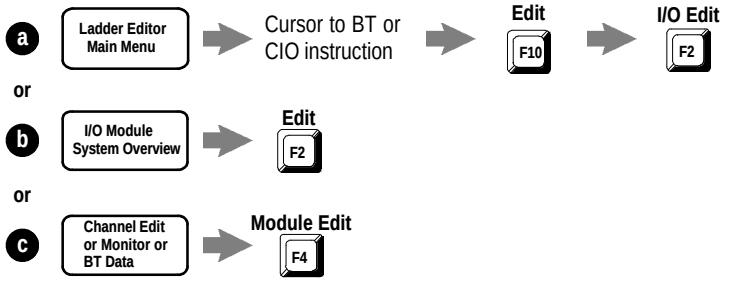
Field:	Valid Values:
Write BT	Address of the control file; and, address and length of the data file.
Read BT	Address of the control file; and, address and length of the data file.
Valid BTW Since Power-Up	Yes or No indicates whether or not a valid BTW or CIO Write occurred after power up.
Latest BTW Configuration	Valid or Invalid indicates the status of the BTW or CIO Write configuration.
Real Time Sampling	Timeout or Normal indicates the status of RTS.
Fuse Status	Ok or Not Ok indicates the status of the fuse.
Channel	Index number of the valid channel.
Address	Logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	The online data from the module. Data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	A word or phrase describing the type of channel data.
Channel Ranges	Normal, Overrange, or Underrange indicates the status of the channel.
Channel Alarms	Normal, High Alarm, or Low Alarm indicates the alarm status of the channel.

Configuring 1771-IR Series A and Series B

To configure a 1771-IR series A or series B module, follow the steps below.

Module Edit Screen 1771-IR

Choose one:




```
1771 IR/A                    Module Edit                          R G M: 1 1 1


                          sensor type:  platinum

                          data format:  BCD

                     units of measure:  degrees C

                real time sample rate:   .0 second(s) (0 = disabled)




Press F9(Toggle) to change selection.

Rem Prog                                          mod 6 of 6      Addr#12:TEST
Change     I/O    Channel          Monitor BT Data                 Default Toggle  Accept
 Mode    Ovrview  Edit                    Tables                   Config
  F1       F2      F3                F5      F6                     F8      F9      F10
```

Field:	Valid Values:
Sensor Type	Press [F9] Toggle to select 10 ohm Copper, Platinum, Nickel, or Other. The default is Platinum.
Data Format	Press [F9] Toggle to select Signed Magnitude Binary, Twos Complement Binary, or BCD. The default is BCD. If the Units of Measure is ohms, the software sets Signed Magnitude Binary as the data format.
Units of Measure	Press [F9] Toggle to select Degrees C, Degrees F, or ohms. The default is Degrees C. If the Sensor Type is Nickel or Other, the Units of Measure must be ohms. If the Units of Measure is Degrees C or Degrees F, you can still set individual channels on the Channel Edit screen to report ohms.
Real Time Sample Rate	Enter a value: Series A: 0.35 or 0.4 to 3.1 Series B: 0.1 to 3.1 Enter 0 for disabled. The default is disabled.
Copper RTD Resistance	This field only appears if the Sensor Type is Copper. Enter a value: Series A: 9.00 to 10.99 ohms Series B: 9.00 to 11.00 ohms The default is 10.00 ohms.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 1771-IR

Choose one:

a. I/O Module System Overview → Edit (F2) → Channel Edit (F3)

or

b. Module Edit or Monitor or BT Data → Channel Edit (F3)

or

c. Ladder Editor Main Menu → Cursor to BT or CIO instruction → Edit (F10) → I/O Edit (F2) → Channel Edit (F3)

```
1771 IR/A                    Channel Edit                          R G M: 1 1 1


 Ch      Address      Data      Units      Bias     ||    Offset       Gain
 1        N120:52        .0   degrees C       .0   ||         0       .0000%
                                                    ||
 2        N120:53        .0   degrees C       .0   ||         0       .0000%
                                                    ||
 3        N120:54        .0   degrees C       .0   ||         0       .0000%
                                                    ||
 4        N120:55        .0   degrees C       .0   ||         0       .0000%
                                                    ||
 5        N120:56        .0   degrees C       .0   ||         0       .0000%
                                                    ||
 6        N120:57        .0   degrees C       .0   ||         0       .0000%
                                                    ||



Enter a channel number.
>
Rem Prog                                          mod 6 of 6      Addr#12:TEST
Change     I/O          Module  Monitor BT Data Display Default          Accept
 Mode    Ovrview          Edit           Tables  Symbols Config
  F1       F2             F4      F5       F6      F7      F8             F10
```

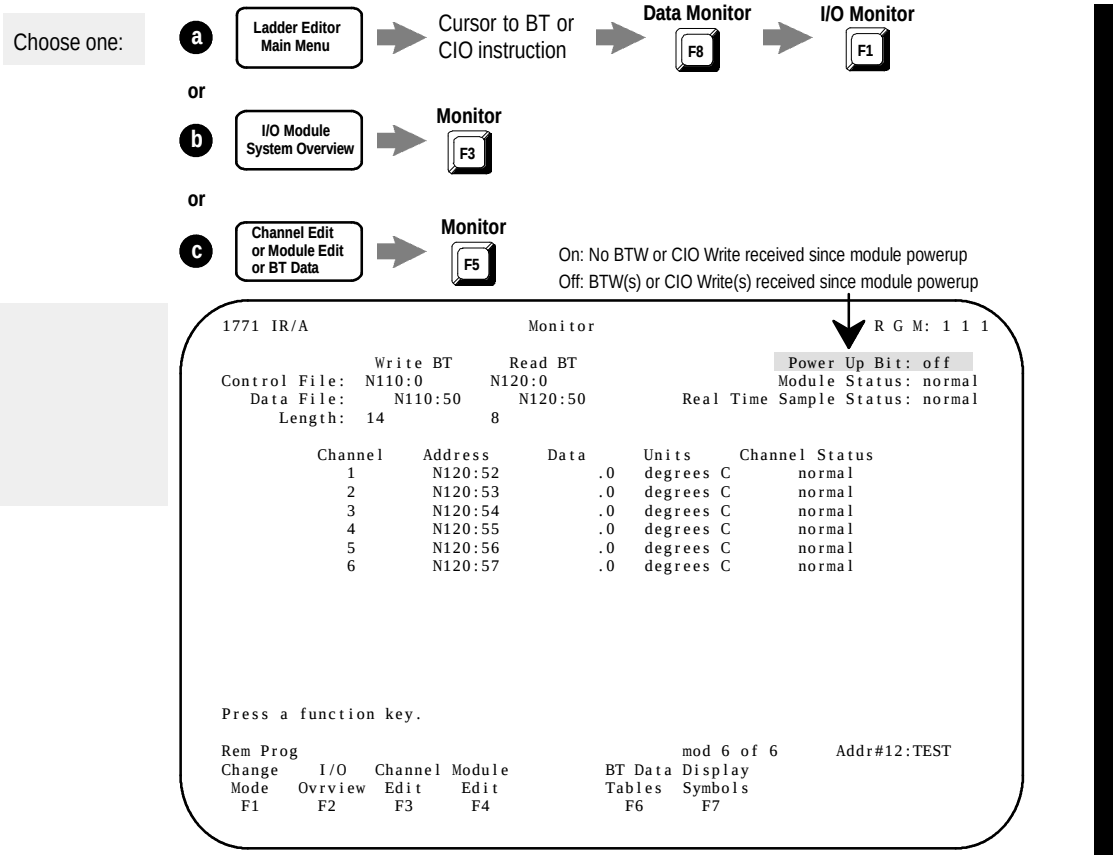
Field:	Valid Values:
Channel	Index number of a valid channel. Enter 1 to 6 to move to the line for that channel, or use the arrow keys.
Address	Displays the logical address of the value in the Data field (display only). Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays data from the module. The data is read from the module's BTR or CIO Read data file. The data in this field cannot be edited on this screen (display only). If the processor is not in Run mode, the data reflects input values the last time a BTR or CIO Read was performed.
Units	Select a single channel in ohms. Toggles between the units specified on the Module Edit screen (Degrees C, Degrees F) and ohms. If the Units of Measure on the Module Edit screen is ohms, the software sets the Units to ohms.
Bias	Enter a value for the range according to the table below: Range | Sensor Type | Units 0 to 999.9 | copper | degrees C or degrees F 0 to 99.99 | copper | ohms 0 to 999.9 | not copper | degrees C or degrees F 0 to 299.97 | not copper | ohms The default is 0.
Offset	Enter the offset value for manual calibration: Series A: 127 to 127 (the default is 0) Series B: 1.295 to 1.295 Valid values are in steps of about 0.010; the software calculates the nearest valid value to the number you enter. The default is 0. If you plan to perform auto-calibration, all manual calibration offset and gain fields must be 0.
Gain Value for Manual Calibration	Series A: Enter the gain value for manual calibration between 1.5503 and 1.5503. Valid values are in steps of about 0.0122; the software calculates the nearest valid value to the number you enter. Series B: Enter a value between 0.19379 and 0.19379 for manual calibration. Valid values are in steps of about 0.00153; the software calculates the nearest valid value to the number you enter. If you plan to perform auto-calibration, all manual calibration offset and gain fields must be 0.

Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-IR Series A and Series B

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1771-IR


Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Data Monitor
F8
I/O Monitor
F1
or
b
I/O Module System Overview
Monitor
F3
or
c
Channel Edit or Module Edit or BT Data
Monitor
F5
On: No BTW or CIO Write received since module powerup
Off: BTW(s) or CIO Write(s) received since module powerup
1771 IR/A Monitor R G M: 1 1 1
Write BT Read BT Power Up Bit: off
Control File: N110:0 N120:0 Module Status: normal
Data File: N110:50 N120:50 Real Time Sample Status: normal
Length: 14 8
Channel Address Data Units Channel Status
1 N120:52 .0 degrees C normal
2 N120:53 .0 degrees C normal
3 N120:54 .0 degrees C normal
4 N120:55 .0 degrees C normal
5 N120:56 .0 degrees C normal
6 N120:57 .0 degrees C normal
Press a function key.
Rem Prog mod 6 of 6 Addr#12:TEST
Change Mode F1
I/O Ovrview F2
Channel Edit F3
Module Edit F4
BT Data Tables F6
Display Symbols F7

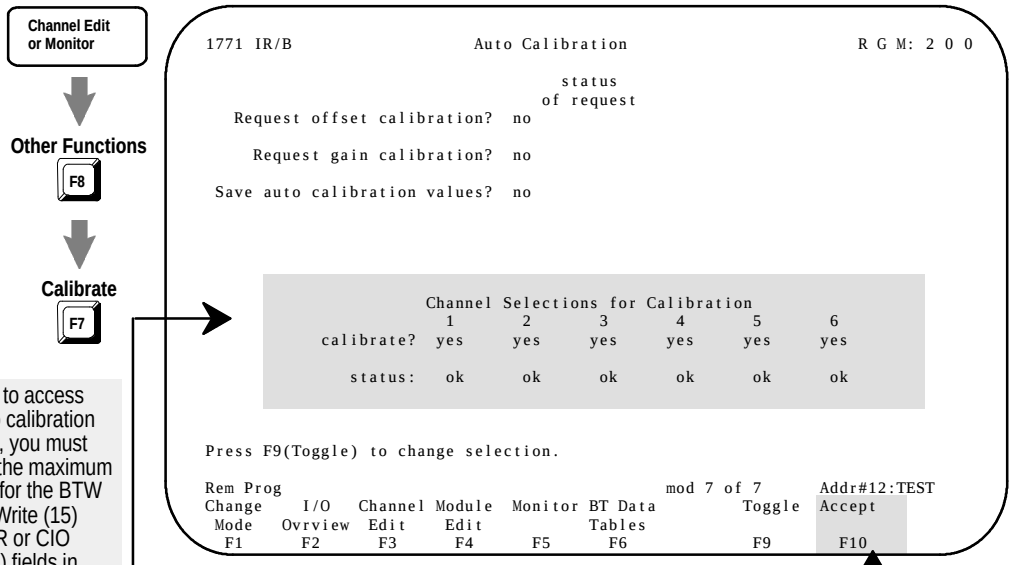
Field:	Valid Values:
Write BT	Control and data file addresses and length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and length for the BTR or CIO Read instruction.
Power-up Bit	ON or OFF to indicate whether or not the module powered up successfully.
Module Status	If the module is faulted, INVALID; otherwise NORMAL.
Real Time Sample Status	If there is an RTS error, INVALID; otherwise NORMAL.
Auto-cal Read from EEPROM	Series B only. If the auto-calibrated values cannot be read from the EEPROM, FAILED; otherwise NORMAL.
Channel	Index number of the valid channel.
Address	Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays online data from the module. The data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	Displays Degrees C, Degrees F, or ohms.
Channel Status	Displays any alarms (Normal, OVERRANGE, or UNDERRANGE).

Auto-Calibrating 1771-IR Series B

You must be connected to a processor to calibrate a module. To calibrate a 1771-IR series B module, follow the steps on the left.

Auto Calibration Screen 1771-IR Series B only

Note *The offset and gain values on the Channel Edit screen must be 0. See page 2-21.*



In order to access the auto calibration function, you must specify the maximum lengths for the BTW or CIO Write (15) and BTR or CIO Read (9) fields in your ladder program.

1. Choose channels to calibrate. Set others to NO here by pressing **[F9]** **Toggle**.
2. Set `Request offset calibration` to yes.
3. Apply a precision resistance of 1.00 ohm to all selected channels.
4. Press this key, then press **[F8]** **Yes** twice, as it appears.
5. Press **[F9]** **Toggle** to set `Request offset calibration` to no.
6. Repeat step 4.
7. Set `Request gain calibration` to yes.
8. Apply a precision resistance of 402.00 ohms to all selected channels.
9. Repeat step 4.
10. Set `Save auto-calibration values` to yes.
11. Repeat step 4.

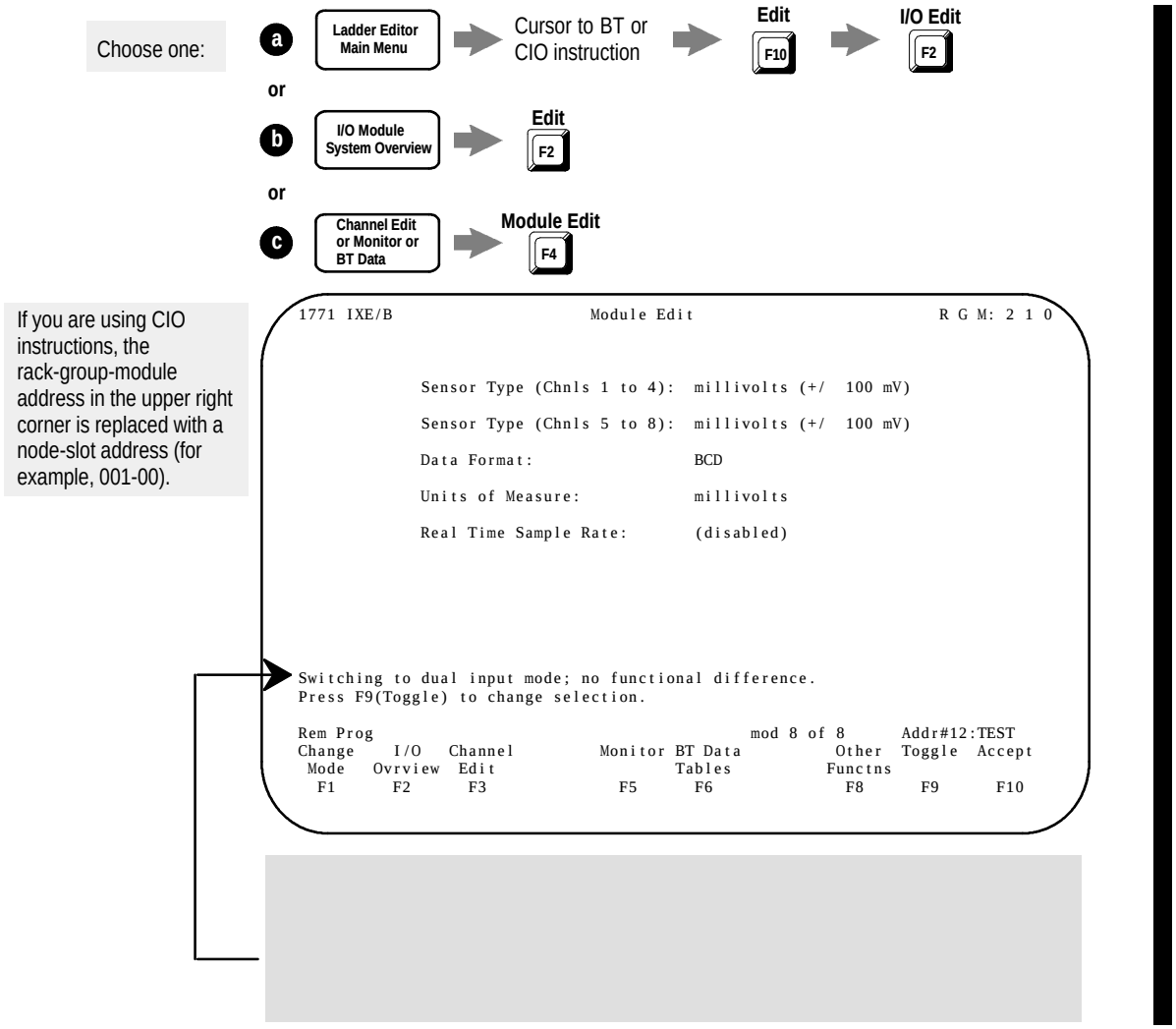
If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

Field:	Valid Values:
Request Offset Calibration	Press [F9] Toggle to select Yes or No. Apply 1.00 ohm to all channels before pressing [F10] Accept.
Request Gain Calibration	Press [F9] Toggle to select Yes or No. Apply 402.00 ohms to all channels before pressing [F10] Accept.
Save Auto-calibration Values	Press [F9] Toggle to select Yes or No.
Status of Request	Displays COMPLETE when the calibrate request completed successfully.
Request Failed Because	This message appears if a calibrate request fails (BAD CAL OR EEPROM FAULT).
Channel Selections for Calibration Calibrate Status	 Press [F9] Toggle to select whether you want that channel calibrated. Displays the status of the channel: if the calibration is successful, OK; otherwise FAILED.

Configuring 1771-IXE Series A and Series B

To configure a 1771-IXE series A or series B module, follow the steps below.

Module Edit Screen 1771-IXE

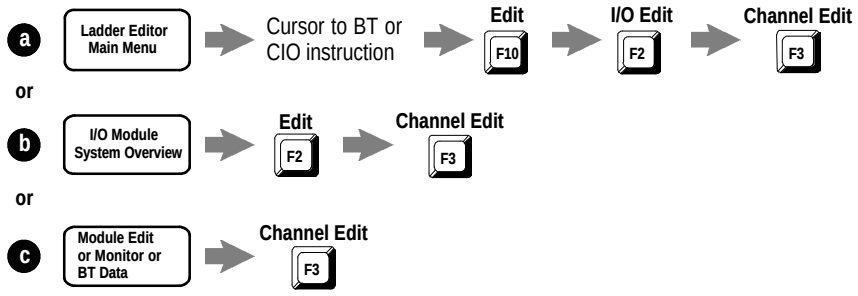

Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Edit
F10
I/O Edit
F2
or
b
I/O Module System Overview
Edit
F2
or
c
Channel Edit or Monitor or BT Data
Module Edit
F4
If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).
1771 IXE/B Module Edit R G M: 2 1 0
Sensor Type (Chnls 1 to 4): millivolts (+/ 100 mV)
Sensor Type (Chnls 5 to 8): millivolts (+/ 100 mV)
Data Format: BCD
Units of Measure: millivolts
Real Time Sample Rate: (disabled)
Switching to dual input mode; no functional difference.
Press F9(Toggle) to change selection.
Rem Prog mod 8 of 8 Addr#12:TEST
Change I/O Channel Monitor BT Data Other Toggle Accept
Mode Ovrview Edit Tables Functns
F1 F2 F3 F5 F6 F8 F9 F10

Field:	Valid Values:
Sensor Type (Channels 1-4)	Press [F9] Toggle to select millivolts (± 100 mV), type E, type J, type K, type T, type R, type S. The default is millivolts.
Sensor Type (Channels 5-8)	Press [F9] Toggle to select millivolts (± 100 mV), type E, type J, type K, type T, type R, type S. The default is millivolts.
Data Format	Press [F9] Toggle to select Signed Magnitude Binary, Twos Complement Binary, or BCD. The default is BCD.
Units of Measure	Press [F9] Toggle to select Degrees C or Degrees F for channels that are in temperature mode. The default is Degrees C. If the Sensor Type is millivolts for channels 1-4 and 5-8, the software sets the Units of Measure to millivolts.
Real Time Sample Rate	Enter a real-time sample rate between 0.1 and 3.1 seconds; enter 0 for disabled. The default is 0.
Calibration	Series B only. Set this field on during manual calibration to scan the cold junction temperature more frequently. Set this field off during normal operation. Press [F9] Toggle to select On or Off. The default is Off.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 1771-IXE

Choose one:




```
1771 IXE/B                    Channel Edit                          R G M: 2 1 0

 Ch     Address     Data    Units  Alarm  Lo Alm   Hi Alm   ||  Offset    Gain
 1       N160:53      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 2       N160:54      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 3       N160:55      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 4       N160:56      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 5       N160:57      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 6       N160:58      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 7       N160:59      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||
 8       N160:60      .00   mV     off        .00      .00   ||      .0   .00000%
                                                             ||

Enter a channel number.
>
Rem Prog                                          mod 8 of 8      Addr#12:TEST
Change     I/O          Module  Monitor BT Data Display  Other          Accept
 Mode    Ovrview          Edit          Tables  Symbols Functns
  F1       F2             F4      F5      F6      F7      F8             F10
```

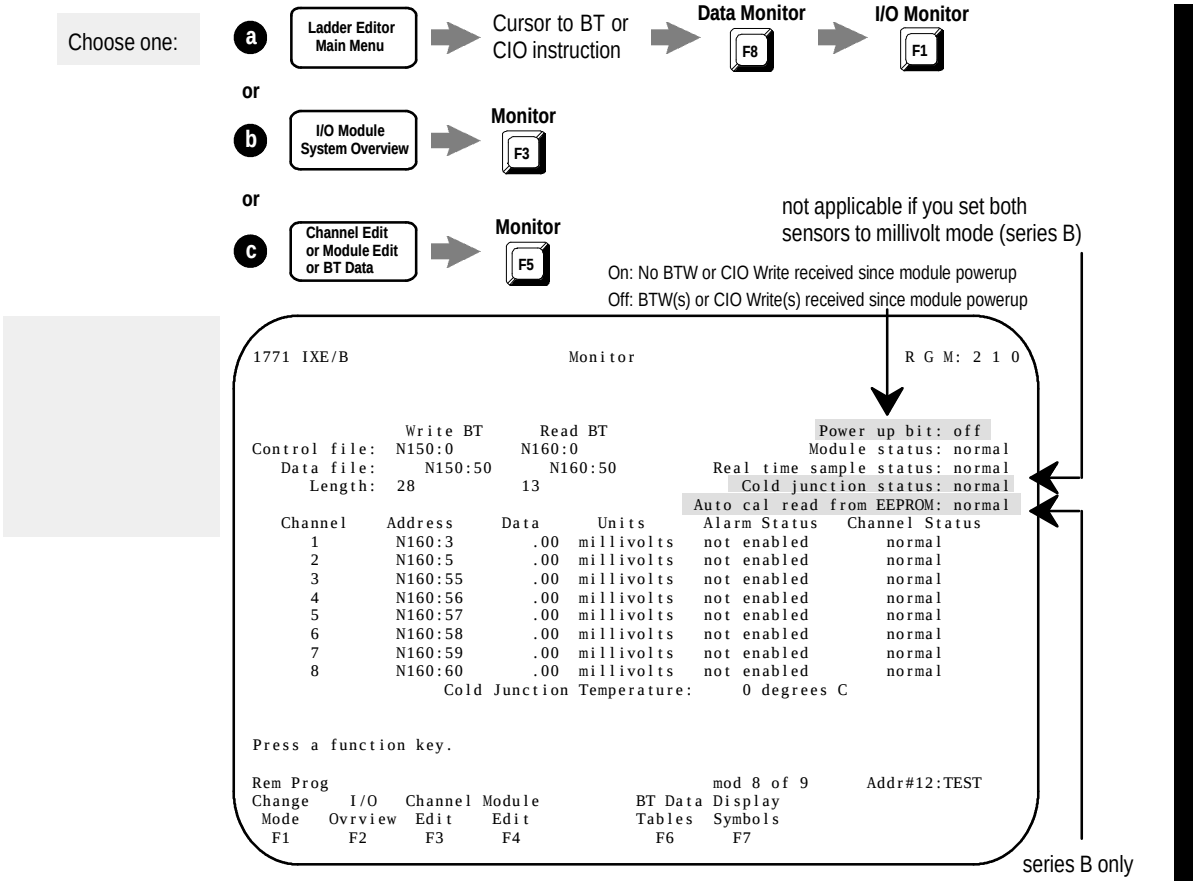
Field:	Valid Values:
Channel	Index number of a valid channel; enter a value between 1 and 8 to move to the line for that channel or use the arrow keys.
Address	Display only. Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Display only. Displays online data from the module. The data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	Display only. Displays Degrees C, Degrees F, or millivolts.
Alarm	Press [F9] Toggle to select On or Off.
Lo Alm	Enter a value from 9999 to 9999. If Units is millivolts, enter a value from -99.99 to 99.99.
Hi Alm	Enter a value from 9999 to 9999. If Units is millivolts, enter a value from 99.99 to 99.99.
Offset	Series A: Enter a value between 127 and 127. The default is 0. Series B: Enter a value from 410.6 to 410.6. Valid values are in steps of about 3.2. The software calculates the nearest valid value to the number you enter. The default is 0. If you plan to perform auto-calibration, all manual calibration offset and gain fields must be 0.
Gain	Series A: Enter a value between 1.5503 and 1.5503. Valid values are in steps of about 0.0122; the software calculates the nearest valid value to the number you enter. The default is 0. Series B: Enter a value between 0.19379 and 0.19379. Valid values are in steps of about 0.00153; the software calculates the nearest valid value to the number you enter. If you plan to perform auto-calibration, all manual calibration offset and gain fields must be 0.

Press **[F4] - Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-IXE Series A and Series B

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1771-IXE


Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Data Monitor
F8
I/O Monitor
F1
or
b
I/O Module System Overview
Monitor
F3
or
c
Channel Edit or Module Edit or BT Data
Monitor
F5
not applicable if you set both sensors to millivolt mode (series B)
On: No BTW or CIO Write received since module powerup
Off: BTW(s) or CIO Write(s) received since module powerup
1771 IXE/B Monitor R G M: 2 1 0
Write BT Read BT
Control file: N150:0 N160:0
Data file: N150:50 N160:50
Length: 28 13
Power up bit: off
Module status: normal
Real time sample status: normal
Cold junction status: normal
Auto cal read from EEPROM: normal
Channel Address Data Units Alarm Status Channel Status
1 N160:3 .00 millivolts not enabled normal
2 N160:5 .00 millivolts not enabled normal
3 N160:55 .00 millivolts not enabled normal
4 N160:56 .00 millivolts not enabled normal
5 N160:57 .00 millivolts not enabled normal
6 N160:58 .00 millivolts not enabled normal
7 N160:59 .00 millivolts not enabled normal
8 N160:60 .00 millivolts not enabled normal
Cold Junction Temperature: 0 degrees C
Press a function key.
Rem Prog mod 8 of 9 Addr#12:TEST
Change Mode F1
I/O Ovrview F2
Channel Edit F3
Module Edit F4
BT Data Tables F6
Display Symbols F7
series B only

Field:	Valid Values:
Write BT	Control and data file addresses and length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and length for the BTR or CIO Read instruction.
Power-up Bit	ON or OFF to indicate whether or not the module powered up successfully.
Module Status	If the module is faulted, FAULTED; otherwise NORMAL.
Real Time Sample Status	If there is an RTS error, INVALID; otherwise NORMAL.
Cold Junction Status	Cold junction error: NORMAL, LOW, or HIGH. This field does not apply when the 1771-IXE/B module is set to millivolt mode for both sensors.
Auto-cal Read from EEPROM	Series B only. If the auto-calibrated values cannot be read from the EEPROM, FAILED; otherwise NORMAL.
Channel	Index number of a channel.
Address	Displays the logical address of the value in the Data field. Press [F7] to display symbols (if defined) in place of addresses.
Data	Displays online data from the module. The data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	Displays Degrees C, Degrees F, or millivolts.
Alarm Status	Displays the status of the alarm.
Channel Status	Displays the channel data (Normal, Overrange, or Underrange).
Cold Junction Temperature	Displays °C and °F.

Auto-Calibrating 1771-IXE Series B

You must be connected to a processor to calibrate a module. To calibrate a 1771-IXE series B module, follow the steps on the left.

Auto Calibration Screen 1771-IXE Series B only

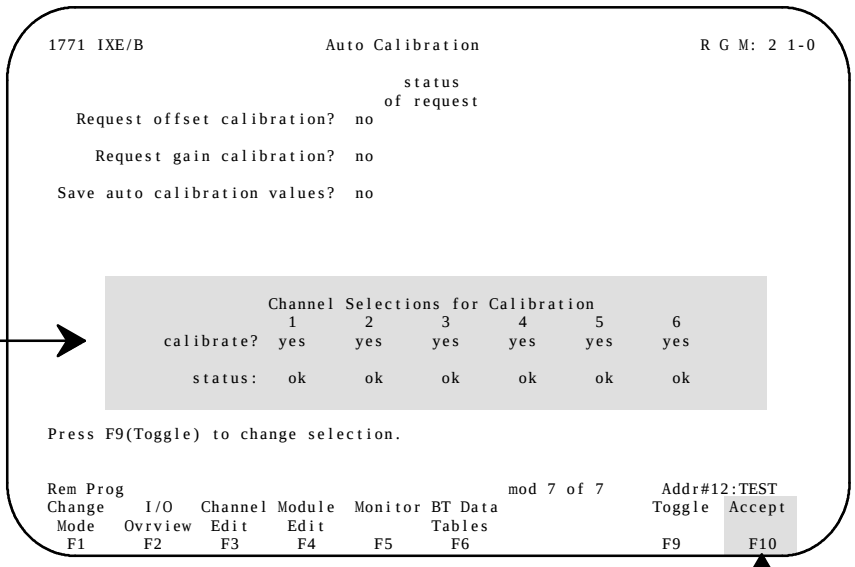
Note *The offset and gain values on the Channel Edit screen must be 0. See page 2-29.*

In order to access the auto calibration function, you must specify the maximum lengths for the BTW or CIO Write (15) and BTR or CIO Read (9) fields in your ladder program.

Channel Edit or Monitor

Other Functions F8

Calibrate F7


1771 IXE/B Auto Calibration R G M: 2 1-0
status of request
Request offset calibration? no
Request gain calibration? no
Save auto calibration values? no
Channel Selections for Calibration
1 2 3 4 5 6
calibrate? yes yes yes yes yes yes
status: ok ok ok ok ok ok
Press F9(Toggle) to change selection.
Rem Prog mod 7 of 7 Addr#12:TEST
Change Mode F1
I/O Ovrview F2
Channel Edit F3
Module Edit F4
Monitor F5
BT Data Tables F6
Toggle F9
Accept F10

1. Choose channels to calibrate. Set others to NO here by pressing **[F9] Toggle.**
2. Set Request offset calibration to yes.
3. Apply a precision voltage of 0.000 mV to all selected channels.
4. Press this key, then press **[F8] Yes** twice, as it appears.
5. Press **[F9] Toggle** to set Request offset calibration to no.
6. Repeat step 4.
7. Set Request gain calibration to yes.
8. Apply a precision voltage of 100.000 mV to all selected channels.
9. Repeat step 4.
10. Set Save auto-calibration values to yes.
11. Repeat step 4.

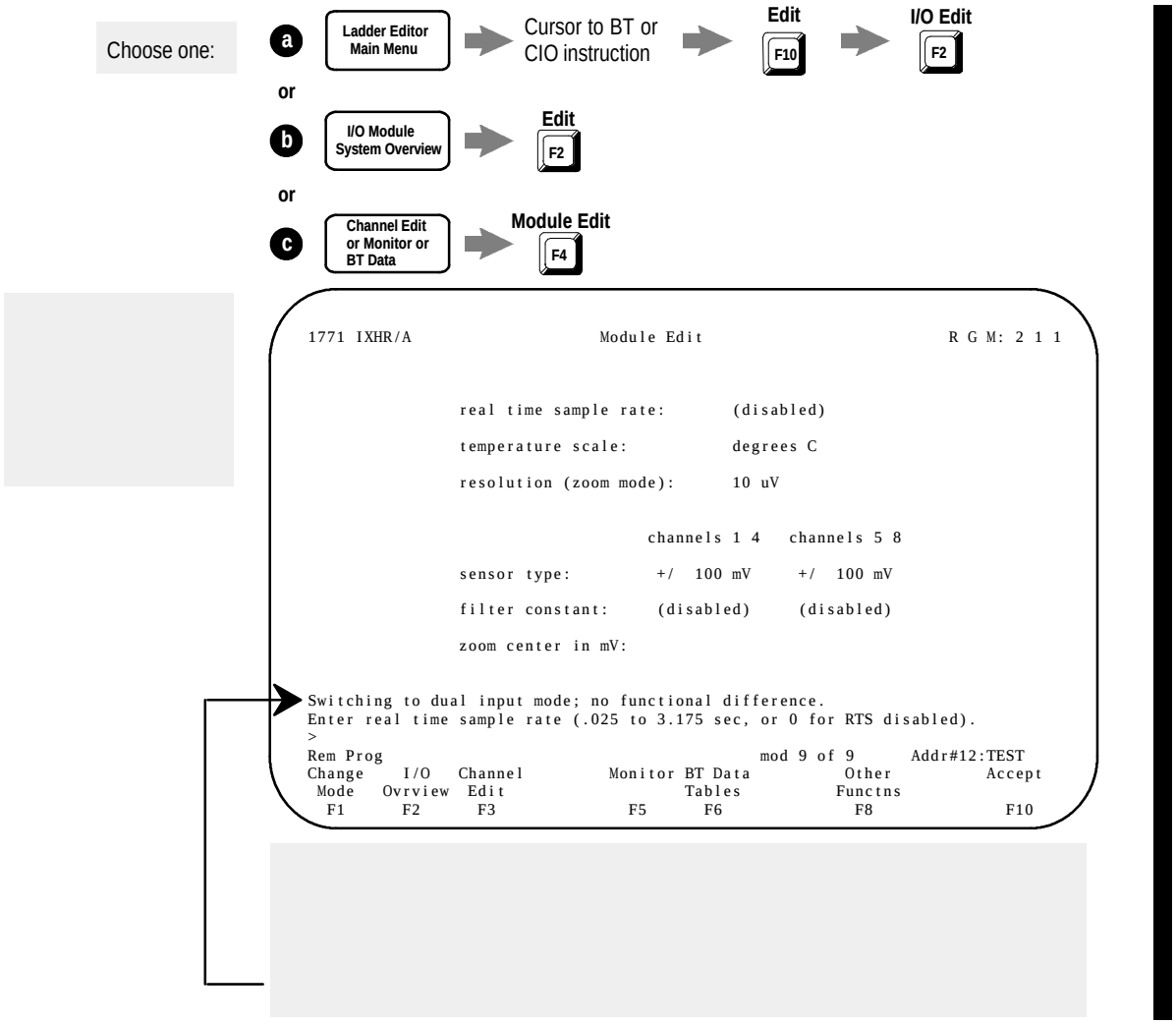
If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

Field:	Valid Values:
Request Offset Calibration	Press [F9] Toggle to select yes or no. Apply 0.000 mV to all channels before pressing [F10] Accept**.**
Request Gain Calibration	Press [F9] Toggle to select yes or no. Apply 100.000 mV to all channels before pressing [F10] Accept**.**
Save Auto-calibration Values	Press [F9] Toggle to select yes or no.
Channel Selections for Calibration Calibrate Status	 Press [F9] Toggle to select whether you want that channel calibrated. Displays the status of the channel: if the calibration is successful, OK; otherwise FAILED.

Configuring 1771-IXHR Series A

To configure a 1771-IXHR series A module, follow the steps below.

Module Edit Screen 1771-IXHR

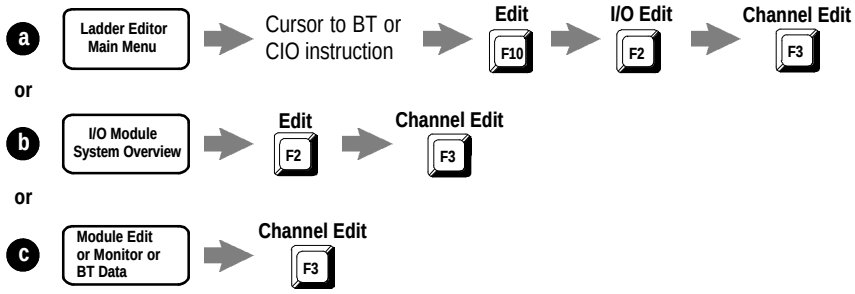


Field:	Valid Values:
Real Time Sample Rate	Enter a real-time sample rate between 0.025 and 3.175 seconds; enter 0 for RTS disabled. The default is disabled. The software rounds the number you enter to the nearest 0.025 second (25 ms), as required by the module.
Temperature Scale	Press [F9] Toggle to select Degrees C or Degrees F. The default is Degrees C. If the sensor type is millivolts for channels 1-4 and 5-8, the temperature scale is disregarded.
Resolution (Zoom Mode)	Press [F9] Toggle to select 10 uV resolution or 1 uV resolution (zoom mode). Zoom mode applies only to channels where the sensor type is mV.
Sensor Type	Press [F9] Toggle to select millivolts (±100 mV), type B, type E, type J, type K, type T, type R, type S. The default is mV.
Filter Constant	Enter values from 0.50 to 6.4 seconds for channels 1-4 and channels 5-8. Valid filter values are in 25 ms increments; the software rounds the value you enter to the nearest 0.025 second (25 ms). Enter 0 for no filter. The default is 0.
Zoom Center in mV	Enter the zoom center between 70 and 70 mV for channels 1-4 and 5-8. This field is only available if zoom mode is enabled and the sensor type is mV.

Press **[F3] - Channel Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 1771-IXHR

Choose one:




```
1771 IXHR/A                    Channel Edit                          R G M: 2 1 1


    Ch     Address     Data    Units  Lo Alm   Hi Alm   ||  Offset    Gain
    1       N180:53       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    2       N180:54       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    3       N180:55       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    4       N180:56       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    5       N180:57       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    6       N180:58       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    7       N180:59       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||
    8       N180:60       .00   mV         .00       .00  ||       .0   .00000%
                                                          ||

Enter a channel number.
>
Rem Prog                                          mod 9 of 9      Addr#12:TEST
Change     I/O           Module  Monitor BT Data Display  Other          Accept
 Mode    Ovrview          Edit          Tables  Symbols Functns
  F1       F2             F4       F5      F6      F7      F8             F10
```

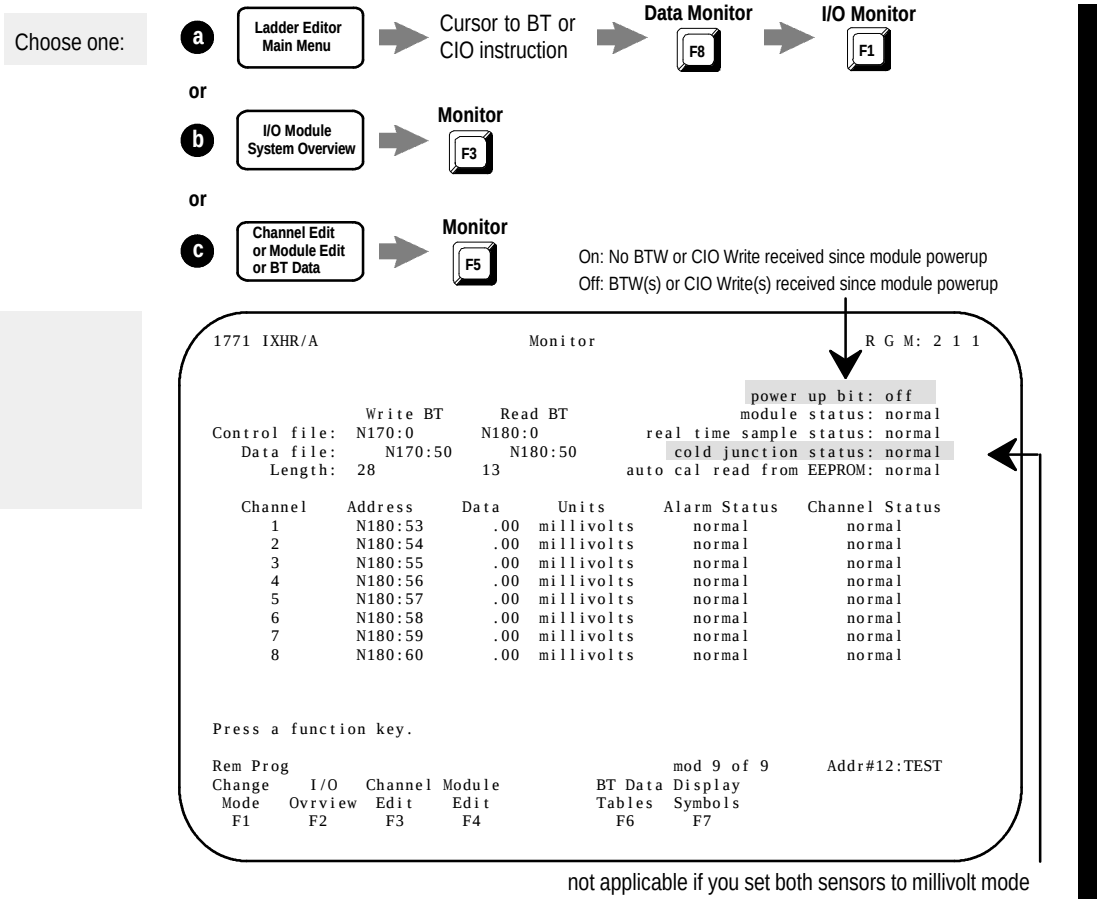
Field:	Valid Values:
Channel	Index number of a valid channel; enter a value between 1 and 8 to move to the line for that channel, or use the arrow keys.
Address	Display only. Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Display only. Displays online data from the module. The data is read from the BTR or CIO Read data file on the processor and may be out of date if the processor is not in Run mode.
Units	Displays Degrees C, Degrees F, or millivolts.
Lo Alm and Hi Alm	Enter a value from: in temperature modes: 3276.8 to 3276.7 in mV mode, with 10 uV resolution: 327.68 to 327.67 in mV mode, with 1 uV resolution 32.768 to 32.76. For channels in this mode, with this resolution, the alarm values are not absolute voltages but permitted deviations from the zoom center you specified on the Module Edit screen. There is no separate alarm enable field. If you set low alarm equal to high alarm for any channel, alarms are disabled for that channel.
Offset	Enter a value between 410.6 and 410.6. Valid values are in steps of about 3.2; the software calculates the nearest valid value of the number you enter. If you plan to perform auto-calibration, all manual offset and gain fields must be 0.
Gain	Enter a value between 0.193787 and 0.193787. Valid values are in steps of about 0.00153; the software calculates the nearest valid value to the number you enter. If you plan to perform auto-calibration, all manual offset and gain fields must be 0.

Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-IXHR Series A

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1771-IXHR


Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Data Monitor
F8
I/O Monitor
F1
or
b
I/O Module System Overview
Monitor
F3
or
c
Channel Edit or Module Edit or BT Data
Monitor
F5
On: No BTW or CIO Write received since module powerup
Off: BTW(s) or CIO Write(s) received since module powerup
1771 IXHR/A Monitor R G M: 2 1 1
power up bit: off
Write BT Read BT module status: normal
Control file: N170:0 N180:0 real time sample status: normal
Data file: N170:50 N180:50 cold junction status: normal
Length: 28 13 auto cal read from EEPROM: normal
Channel Address Data Units Alarm Status Channel Status
1 N180:53 .00 millivolts normal normal
2 N180:54 .00 millivolts normal normal
3 N180:55 .00 millivolts normal normal
4 N180:56 .00 millivolts normal normal
5 N180:57 .00 millivolts normal normal
6 N180:58 .00 millivolts normal normal
7 N180:59 .00 millivolts normal normal
8 N180:60 .00 millivolts normal normal
Press a function key.
Rem Prog mod 9 of 9 Addr#12:TEST
Change Mode F1
I/O Ovrview F2
Channel Edit F3
Module Edit F4
BT Data Tables F6
Display Symbols F7
not applicable if you set both sensors to millivolt mode

Field:	Valid Values:
Write BT	Control and data file addresses and length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and length for the BTR or CIO Read instruction.
Power-up Bit	ON or OFF to indicate whether or not the module powered up successfully.
Module Status	If the module is faulted, FAULTED; otherwise NORMAL.
Real Time Sample Status	If there is a RTS error, INVALID; otherwise NORMAL.
Cold Junction Status	Cold junction error: NORMAL, LOW or HIGH. This field does not apply when the 1771-IXHR module is set to millivolt mode for both sensors.
Auto-cal Read from EEPROM	If the auto-calibrated values cannot be read from the EEPROM, FAILED; otherwise NORMAL.
Dynamic Clamp Inhibited [1]	Displays whether the dynamic clamp is inhibited (yes) or not (no).
Channel	Index number of a channel.
Address	Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays online data from the module. The data is read from the module's BTR or CIO Read data file and may be out of date if the processor is not in Run mode.
Units	Displays an engineering unit string to describe the type of channel data (Degrees C, Degrees F, or millivolts).
Alarm Status	Displays the status of the alarm (NORMAL, LOW ALARM, or HIGH ALARM).
Channel Status	Displays the channel status (NORMAL, OVERRANGE, or UNDERRANGE).

[1] This field only applies to a 1771-IXHR series A module, revision B or later.

Auto-Calibrating 1771-IXHR Series A

You must be connected to a processor to calibrate a module. To calibrate a 1771-IXHR Series A module, follow the steps on the left.

Auto Calibration Screen 1771-IXHR Series A

Note *The offset and gain values on the Channel Edit screen must be 0. See page 2-37.*

In order to access the auto calibration function, you must specify the maximum lengths for the BTW or CIO Write (15) and BTR or CIO Read (9) fields in your ladder program.

Channel Edit or Monitor

↓

Other Functions F8

↓

Calibrate F7

```
1771 IXHR/A                 Auto Calibration                    R G M: 2 1-0


                                        status
                                      of request
   Request offset calibration?  no

     Request gain calibration?  no

 Save auto calibration values?  no


                  Channel Selections for Calibration
                        1      2      3      4      5      6
       calibrate?   yes    yes    yes    yes    yes    yes

           status:    ok     ok     ok     ok     ok     ok

Press F9(Toggle) to change selection.


Rem Prog                                        mod 7 of 7      Addr#12:TEST
Change     I/O    Channel Module  Monitor BT Data                  Toggle  Accept
 Mode    Ovrview   Edit    Edit            Tables
  F1       F2      F3      F4      F5      F6                       F9      F10
```

1. Choose channels to calibrate. Set others to NO here by pressing **[F9] Toggle.**
2. Set Request offset calibration to yes.
3. Apply a precision voltage of 0.000 mV to all selected channels.
4. Press this key, then press **[F8] Yes** twice, as it appears.
5. Press **[F9] Toggle** to set Request offset calibration to no.
6. Repeat step 4.
7. Set Request gain calibration to yes.
8. Apply a precision voltage of 100.000 mV to all selected channels.
9. Repeat step 4.
10. Set Save auto-calibration values to yes.
11. Repeat step 4.

If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

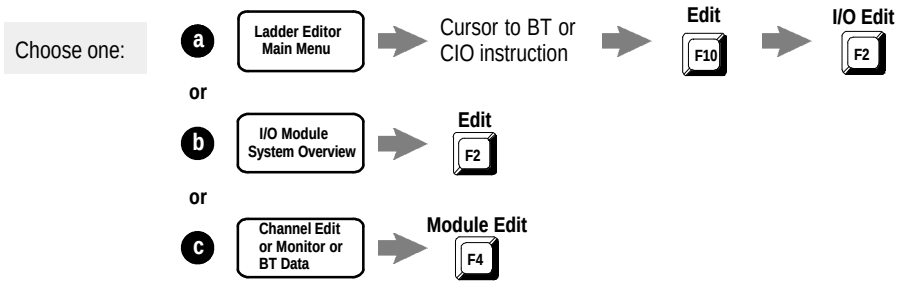
Field:	Valid Values:
Request Offset Calibration	Press [F9] Toggle to select Yes or No. Apply 0.000 mV to all channels before pressing [F10] Accept**.**
Request Gain Calibration	Press [F9] Toggle to select Yes or No. Apply 100.000 mV to all channels before pressing [F10] Accept**.**
Save Auto-calibration Values	Press [F9] Toggle to select Yes or No.
Request Clamp Inhibit [1]	Press [F9] Toggle to select Yes or No.
Channel Selections for Calibration Calibrate Status	 Press [F9] Toggle to select whether you want that channel calibrated. Displays the status of the channel: if the calibration is successful, OK; otherwise FAILED.

[1] This field only applies to a 1771-IXHR series A module, revision B or later.

Configuring 1771-OFE Series A and Series B

To configure a 1771-OFE series A or series B module, follow the steps below.

Module Edit Screen 1771-OFE

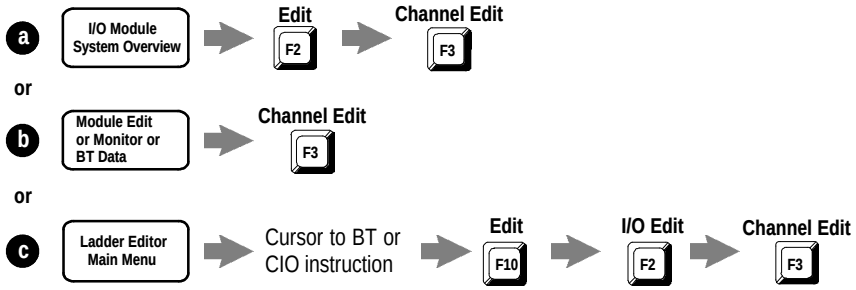



```
1771 OFE/A                    Module Edit                    R G M: 0 0 1




                          Data Format:  BCD




Press F9(Toggle) to change selection

Rem Prog                                        mod 2 of 9      Addr#12:TEST
Change     I/O    Channel          Monitor BT Data          Default Toggle  Accept
 Mode    Ovrview  Edit                    Tables            Config
  F1       F2       F3               F5       F6              F8       F9       F10
```

Field:	Valid Values:
Data Format	Press [F9] Toggle to select BCD or Twos Complement Binary. The default is BCD.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 1771-OFE




```
1771 OFE/A                    Channel Edit                        R G M: 0 0 1




    Ch      Address      Data      Units      % of Output     Min        Max
     1       N50:50         0                    *** %          0          0

     2       N50:51         0                    *** %          0          0

     3       N50:52         0                    *** %          0          0

     4       N50:53         0                    *** %          0          0




Enter a channel number.
>
Rem Prog                                          mod 2 of 9      Addr#12:TEST
Change     I/O          Module  Monitor BT Data Display Default          Accept
 Mode    Ovrview         Edit           Tables  Symbols Config
  F1       F2            F4       F5      F6      F7      F8              F10
```

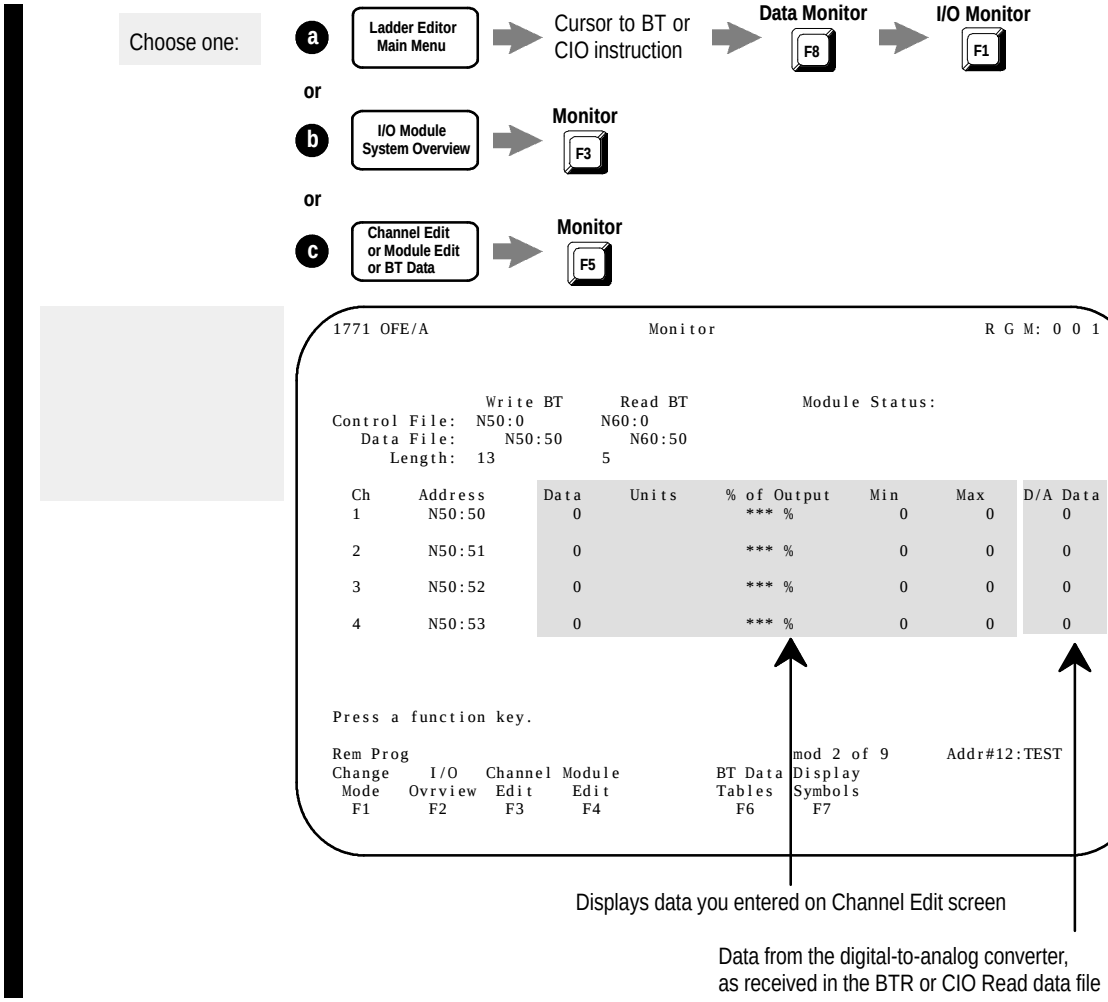
Field:	Valid Values:
Channel	Index number of a valid channel. Enter 1 to 4 to move to the line for that channel or use the arrow keys.
Address	Displays the logical address of the value in the Data field (display only). Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Enter a value between the Min and Max values. The default is 0. You can enter a data value or a percentage of output. If you enter a data value, the % of Output (min to max) is calculated. If you enter a % of Output, the data value is calculated.
Units	Enter a word or phrase of up to 10 characters that describes the type of channel data or press [F9] Toggle to make a choice. The I/O configuration utility only saves units currently in use by the module on the Channel Edit screen.
% of Output	Enter a value for the percentage (0 to 100%). The default is 0%. You can enter a data value or a percentage of output. If you enter a data value, the % of Output (min to max) is calculated. If you enter a % of Output, the data value is calculated. If the min or max value is changed, the % of Output is recalculated. For example, if min is 0 and max is 4095, and you enter 25%, the software computes the value 1024.
Min	Lets you change the minimum scaling value for each channel (9999 to max). The default is 0. A new minimum scaling value causes the % output to be recalculated.
Max	Lets you change the maximum scaling value for each channel (min to 9999). The default is 4095. A new maximum scaling value causes the % output to be recalculated.

Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-OFE Series A and Series B

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1771-OFE


Choose one:
a
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Data Monitor
F8
I/O Monitor
F1
or
b
I/O Module System Overview
Monitor
F3
or
c
Channel Edit or Module Edit or BT Data
Monitor
F5
1771 OFE/A Monitor R G M: 0 0 1
Write BT Read BT Module Status:
Control File: N50:0 N60:0
Data File: N50:50 N60:50
Length: 13 5
Ch Address Data Units % of Output Min Max D/A Data
1 N50:50 0 *** % 0 0 0
2 N50:51 0 *** % 0 0 0
3 N50:52 0 *** % 0 0 0
4 N50:53 0 *** % 0 0 0
Press a function key.
Rem Prog Change Mode F1
I/O Ovrview F2
Channel Edit F3
Module Edit F4
mod 2 of 9
BT Data Tables F6
Display Symbols F7
Addr#12:TEST
Displays data you entered on Channel Edit screen
Data from the digital-to-analog converter, as received in the BTR or CIO Read data file

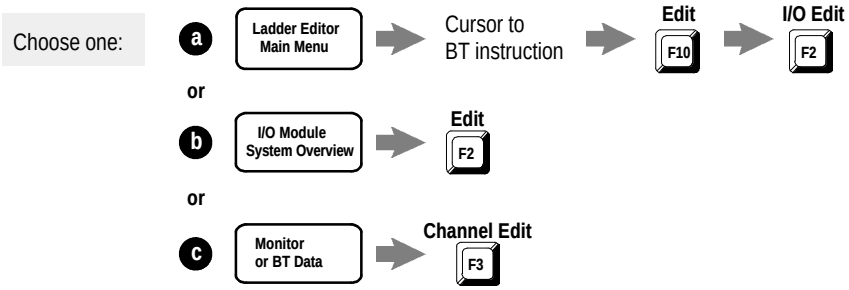
Field:	Valid Values:
Write BT	Control and data file addresses and length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and length for the BTR or CIO Read instruction.
Module Status	If the module is faulted, FAULTED; otherwise NORMAL.
Channel	Index number of the channel.
Address	Displays the logical address of the value in the Data field. Press [F7] to display symbols (if you've defined them) in place of addresses.
Data	Displays online data from the module. The data is read from the module's BTR or CIO Read data file and may be out of date if the processor is not in Run mode.
Units	Displays an engineering unit string to describe the type of channel data.
% of Output	The value displayed is the percentage of the scaling range (Min to Max). For example, if min is 9999, max is 9999, and data is 0, the software displays 50%.
Min	Displays the minimum scaling range.
Max	Displays the maximum scaling range.
D/A Data	Displays data from the digital-to-analog converter, as received in the BTR or CIO Read data file.

Configuring 1771-SDN Series A

To configure a 1771-SDN series A module, follow the steps below.

Note *The 1771-SDN series A module cannot use CIO instructions on ControlNet I/O.*

Channel Edit Screen 1771-SDN




```
1771 SDN/A                    Channel Edit                          R G M: 0 0 0
#1 MAC ID:  0      Port Number:  0          #2 MAC ID:  0      Port Number:  0

   Command:  Ignore Block                   Command:  Ignore Block

   Service:  No Service Request             Service:  No Service Request

   Block Size:  0    Transaction ID:  0     Block Size:  0    Transaction ID:  0

   Class:  0         Instance:  0           Class:  0         Instance:  0

   Attribute:  0                            Attribute:  0

   N11:6     0    0    0    0    0         N11:38    0    0    0    0    0

   N11:11    0    0    0    0    0         N11:43    0    0    0    0    0

   N11:16    0    0    0    0    0         N11:48    0    0    0    0    0


Enter the MAC ID.

Rem Prog                                      mod 1 of 1      File SCANNER
Change     I/O                  Monitor BT Data  Display           Accept
 Mode    Ovrview                        Tables  Symbols
  F1       F2                    F5       F6      F7                F10
```

Field:	Valid Values:
MAC ID	Displays the MAC ID number. Enter a value between 0 and 63.
Port Number	Displays the Port Number. Enter 0 or 1.
Command	Displays the command type. Valid values are Ignore Block, Execute Block, and Report Status.

(Continued)

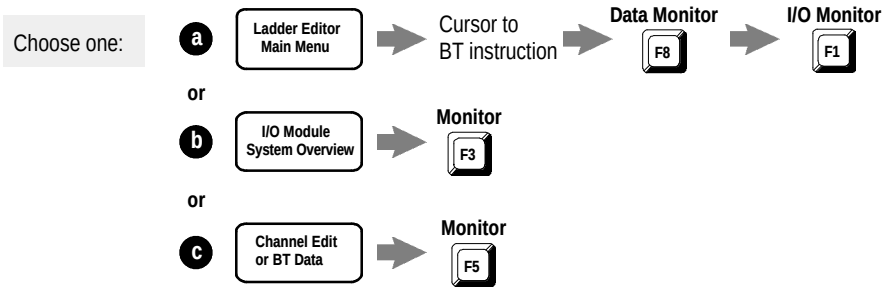
Field:	Valid Values:
Service	Displays one of the following available 1771-SDN/A service requests: • Get Attributes All returns the contents of all attributes of an object or class. • Set Attributes All modifies the contents of the attributes of the class or object. • Reset invokes the reset service of the specified class or object. Typically, this causes a transition to a default state/mode. • Start invokes the start service of the specified class or object. Typically, this places an object into a running state/mode. • Stop Invokes the stop service of the specified class or object. Typically, this places an object into a stopped or idle state/mode. • Create initializes a new object within the specified class. • Delete eliminates an object instance of the specified class. • Apply Attributes causes attribute values in the pending state to become active. • Get Attribute Single returns the contents of the specified attribute. • Set Attribute Single modifies an attribute value. • Find Next Instance causes the specified class to search for and return a list of instance IDs associated with existing object instances (existing instances are those that are currently accessible from DeviceNet). • Restore returns the contents of a class or object's attributes from a storage location accessible by the Save function. Attribute data is copied from a storage area to the currently active memory area used by the class or object. • Save copies the contents of a class or object's attributes to a location accessible by the Restore function. • No Operation causes the receiving object to return a No Operation response. The receiving object does not carry out any other internal action. Use this function to test if a particular object is present and responding without causing a state change.
Block Size	Displays the block size. Enter a value between 0 and 29.
Transaction ID	Displays the transaction ID number. Enter a value between 1 and 255.
Class	Displays the class level. Enter a value between 0 and FFFF (hex).
Instance	Displays the instance number. Enter a value between 0 and FFFF (hex).
Attribute	Displays the attribute level. Enter a value between 0 and FFFF (hex).

Press **[F10]** **Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-SDN Series A

Use the Monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen - 1771-SDN




```
1771 SDN/A                          Monitor                              R G M: 0 0 0
#1 MAC ID:  0      Port Number:  0          #2 MAC ID:  0      Port Number:  0

   Status:  Ignore Transaction Block          Status:  Ignore Transaction Block

   Service:  No Service Request               Service:  No Service Request

   Block Size:  0    Transaction ID:  0       Block Size:  0    Transaction ID:  0

   N13:3        0    0    0    0    0         N13:35       0    0    0    0    0

   N13:8        0    0    0    0    0         N13:40       0    0    0    0    0

   N13:13       0    0    0    0    0         N13:45       0    0    0    0    0

   N13:18       0    0    0    0    0         N13:50       0    0    0    0    0

   N13:23       0    0    0    0    0         N13:55       0    0    0    0    0

Press a function key.

Rem Prog                                          mod 1 of 1      File SCANNER
Change     I/O    Channel                  BT Data Display
 Mode    Ovrview   Edit                     Tables  Symbols
  F1       F2      F3                        F6      F7
```

Field:	Valid Values:
MAC ID	Displays the MAC ID number (between 0 and 63).
Port Number	Displays the Port Number (0 or 1).
Status	Displays one of the following module status messages: • Ignore Transaction Block • Transaction Successful • Transaction in progress • Not in Scan List Table • Slave offline • DeviceNet Port disabled/offline • Transaction ID unknown • Duplication Transaction ID • Invalid Command Code • Scanner out of buffers • Other Client/Server transaction in progress • Service not supported • Could not connect to Slave • Response data too large • Invalid port • Invalid size • Connection busy **Note:** Status field values will constantly update for each BTR that is performed.
Service	Displays one of the following available 1771-SDN/A service responses: • Get Attributes All returns the contents of all attributes of an object or class. • Set Attributes All modifies the contents of the attributes of the class or object. • Reset invokes the reset service of the specified class or object. Typically, this causes a transition to a default state/mode. • Start invokes the start service of the specified class or object. Typically, this places an object into a running state/mode. • Stop Invokes the stop service of the specified class or object. Typically, this places an object into a stopped or idle state/mode. • Create initializes a new object within the specified class. • Delete eliminates an object instance of the specified class. • Apply Attributes causes attribute values in the pending state to become active. • Get Attribute Single returns the contents of the specified attribute. • Set Attribute Single modifies an attribute value.

(Continued)

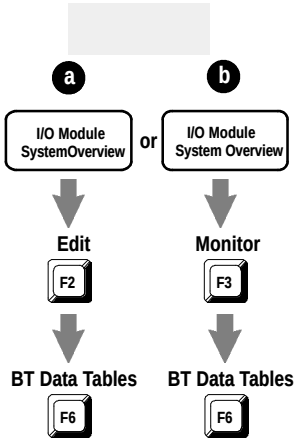
Field:	Valid Values:
Service (Continued)	• Find Next Instance causes the specified class to search for and return a list of instance IDs associated with existing object instances (existing instances are those that are currently accessible from DeviceNet). • Restore returns the contents of a class or object's attributes from a storage location accessible by the Save function. Attribute data is copied from a storage area to the currently active memory area used by the class or object. • Save copies the contents of a class or object's attributes to a location accessible by the Restore function. • No Operation causes the receiving object to return a No Operation response. The receiving object does not carry out any other internal action. Use this function to test if a particular object is present and responding without causing a state change.
Block Size	Displays the block size (between 0 and 29).
Transaction ID	Displays the transaction ID number (between 1 and 255). **Note:** Transaction ID field values will constantly update for each BTR that is performed.

Note

The 1771-SDN series A module supports continuous data reading; be sure that the BTR control block is set for continuous operation when configuring this module. For more information on the 1771-SDN series A module, see the 1771-SDN DeviceNet Scanner Module manual; for more information on using the BTR instruction, see the Instruction Set Reference manual.

Displaying Block Transfer Data for 1771-SDN Series A Modules

Use the Block Transfer Data screen to display an image of the processor data tables for a 1771-SDN series A module without returning to the ladder editor to use the data monitor function. Follow the steps on the left.




```
1771 SDN/A                  Block Transfer Data                    R G M: 0 0 1

Block Transfer Write Data

  N11:0       0     0     0     0

  N11:10      0     0     0     0     0     0     0     0     0     0

  N11:20      0     0     0     0     0

  N11:30      0     0     0     0

  N11:40      0     0     0     0     0     0     0     0     0     0

  N11:50      0     0     0     0     0

  N11:60      0     0     0     0     0     0     0     0     0     0

Press  a function key.

Rem Prog                                                mod 1 of 1      File SCANNER
Change     I/O          Module    Monitor Change  Display
 Mode    Ovrview        Edit                Radix  Symbols
  F1       F2           F3         F5       F6      F7
```

You cannot edit the information on this screen.

3 Configuring N-Series Analog I/O Modules

Chapter Objectives

This chapter explains how to configure N-Series analog I/O modules (1771-NBRC, -NBSC, -NBTC, -NBVC, -NBV1, -NB4S, -NB4T, -NIS, -NIV, -NIVR, -NIVT, -NIV1, -NOC, -NOV, -NR, -NT1, -NT2, -NX1, -NX2, -NX3, -NX4). You should have already read chapter 1 because it explains the basic functions and screens you'll use.

Note

If you used the PLC-5 standalone I/O configuration utility for N-Series modules (prior to release 4.4), and are now using the same processor name, the I/O configuration utility merges these modules into the I/O configuration database. This happens automatically when you first enter the I/O configuration utility from the ladder editor.

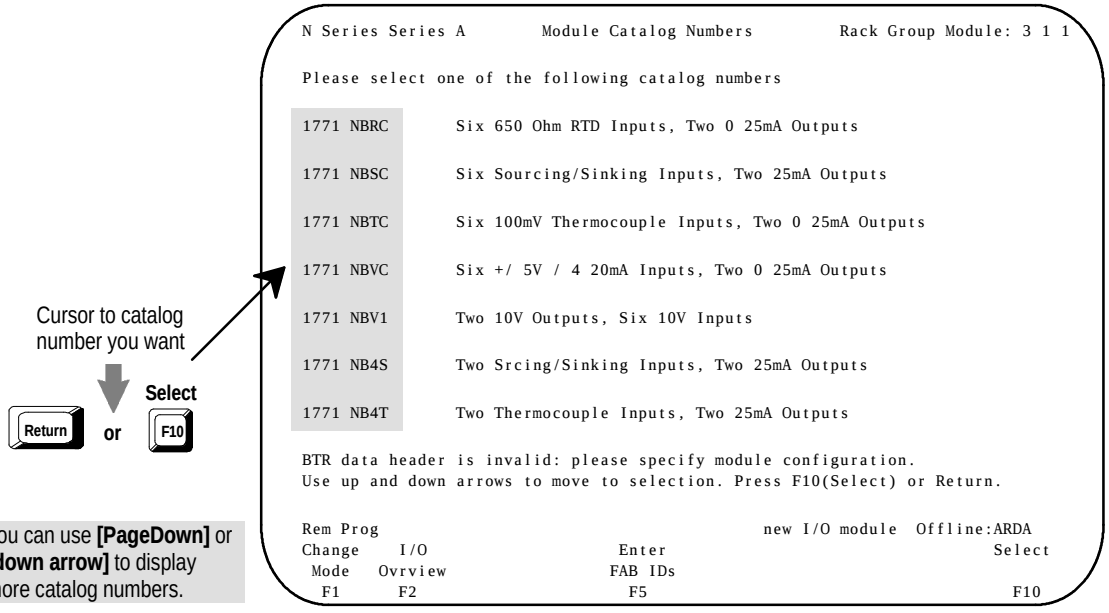
During this merge, a message states that your module list is being merged into the 6200 database. The software edits the module list for you by adding the modules that you had configured using the standalone utility to the module list previously configured using the I/O configuration utility. Save your edits before exiting 6200 programming software or the modules from the I/O standalone configuration utility will disappear from your module list.

Choosing a Catalog Number

When you add an N-Series module to the I/O configuration database, enter the block transfer or ControlNet I/O transfer information on the Block Transfer Control screen. The I/O configuration utility then tries to read the types of the module's channels from the BTR or CIO Read data file. If the configuration information is not available in the BTR or CIO Read data file, the I/O configuration utility prompts you to choose the module's catalog number (see Figure 3.1) or individual channel types (see Figure 3.2) from a displayed list.

If the catalog number you want is on the list, follow the steps on the left. Otherwise, see page 3-3.

Figure 3.1
Choosing the Module's Catalog Number


N Series Series A Module Catalog Numbers Rack Group Module: 3 1 1
Please select one of the following catalog numbers
1771 NBRC Six 650 Ohm RTD Inputs, Two 0 25mA Outputs
1771 NBSC Six Sourcing/Sinking Inputs, Two 25mA Outputs
1771 NBTC Six 100mV Thermocouple Inputs, Two 0 25mA Outputs
1771 NBVC Six +/ 5V / 4 20mA Inputs, Two 0 25mA Outputs
1771 NBV1 Two 10V Outputs, Six 10V Inputs
1771 NB4S Two Srcing/Sinking Inputs, Two 25mA Outputs
1771 NB4T Two Thermocouple Inputs, Two 25mA Outputs
BTR data header is invalid: please specify module configuration.
Use up and down arrows to move to selection. Press F10(Select) or Return.
Rem Prog new I/O module Offline:ARDA
Change Mode F1
I/O Ovrview F2
Enter FAB IDs F5
Select F10
Cursor to catalog number you want
Return
or
Select
F10

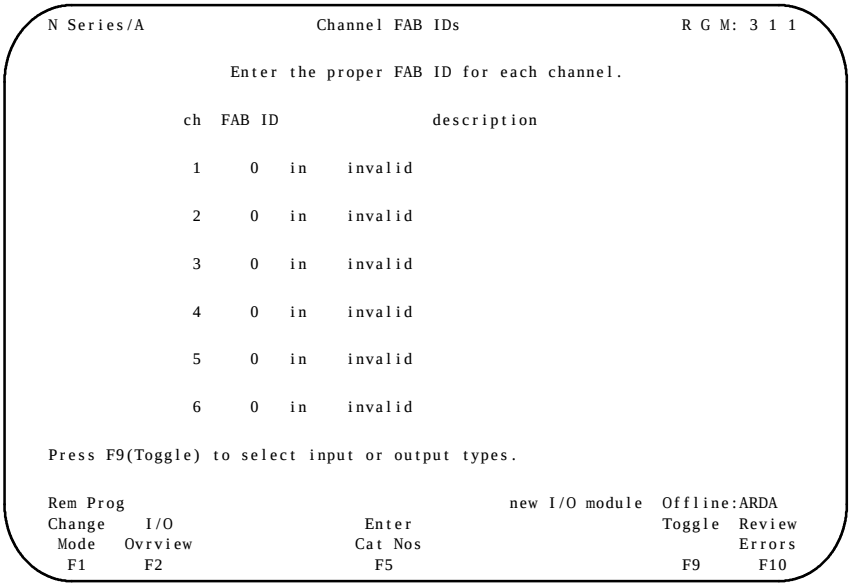
You can use **[PageDown]** or **[down arrow]** to display more catalog numbers.

If the catalog number you want is not on the list, follow the steps on the left.

Figure 3.2
Choosing the Channel Types

Enter FAB IDs

F5


N Series/A Channel FAB IDs R G M: 3 1 1
Enter the proper FAB ID for each channel.
ch FAB ID description
1 0 in invalid
2 0 in invalid
3 0 in invalid
4 0 in invalid
5 0 in invalid
6 0 in invalid
Press F9(Toggle) to select input or output types.
Rem Prog new I/O module Offline:ARDA
Change Mode F1
I/O Ovrview F2
Enter Cat Nos F5
Toggle F9
Review Errors F10

If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

You can configure a channel by entering **either** a description of the channel or the FAB ID number. See the following fields.

Field:	Valid Values:
FAB ID	Enter the FAB ID number (description is displayed on the right). If the module has fewer than 8 channels, enter 127 as the FAB ID for the unused channels.
Description	There are two parts to the description: • Press [F9] Toggle to select Input or Output type. • Press [F9] Toggle until the description appears (numeric ID is on the left). If the module has fewer than 8 channels, toggle to Out and Channel Not Used for each of the unused channels.

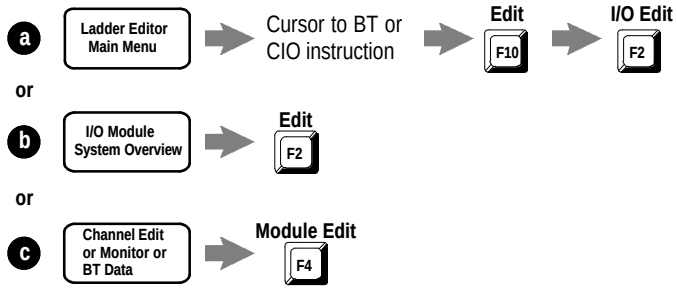
After you configure all eight channels, press **[F10] Accept** to add the module to the database and return to the I/O System Overview screen.

Configuring an N-Series Analog Module

To configure an N-Series Analog Module, follow the steps below.

Module Edit Screen N-Series Analog

Choose one:




```
N Series/A                    Module Edit                          R G M: 3 2 0

                    temperature scale: degrees C

               real time sample interval: (disabled)

                     cold junction alarm: disabled

                            data format: twos complement binary




Press F9(Toggle) to change temperature scale for all channels.

Rem Prog                                          mod 8 of 17     Offline:ARDA
Change     I/O    Channel          Monitor BT Data          Default Toggle  Accept
 Mode    Ovrview  Edit                    Tables            Config
  F1       F2       F3                F5       F6              F8      F9      F10
```

Field:	Valid Values:
Temperature Scale	Press [F9] Toggle to select degrees C or degrees F. Only applies to modules with thermocouple and/or RTD inputs.
Real Time Sample Interval	Enter a real-time sample rate: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.001 second increments) • If the data format is BCD, enter a value between 0.1 and 9.999 seconds (in 0.001 second increments) • Enter 0 to disable
Cold Junction Alarm	Press [F9] Toggle to select Enabled or Disabled. • If you select enabled, overrange and underrange conditions on the cold junction are reported; the module sets the range bit in module status • If you select disabled, overrange and underrange conditions are not reported; the range bit is not set Only applies to modules with thermocouple and/or RTD inputs.
Data Format	Press [F9] Toggle to select Twos Complement Binary, or BCD. The default is Twos Complement Binary.

Press **[F3] Channel Edit** to configure individual channels or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

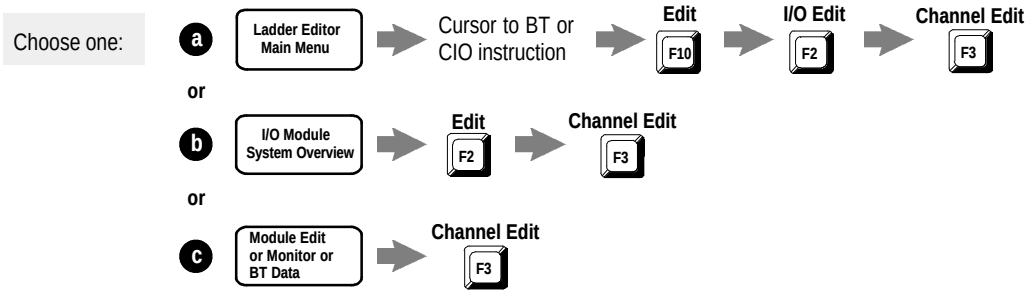
Channel Edit Screens N-Series Analog

Switch Channel

and then press the appropriate function key for the channel you want to edit.

To Edit Channel Information for this Input/Output:	See Page:
5 V input	3-6
10 V input	3-9
55 mV thermocouple input	3-12
100 mV thermocouple input	3-15
650 ohm RTD input	3-18
20 mA sourcing/sinking input	3-21
10 V output	3-24
25 mA output	3-27
50 mA output	3-30

Channel Edit Screen 5 V input




```
N Series/A                  Channel 3 Edit                        R G M: 3 2 0

                          input channel type: +/  5 V

 input data:                      5100          signal:                5.1000 V

 low/high scale: dflt:   1000/  5000           filter const:             .0 sec
 (+1 V / +5 V)

 alarms are:                   enabled          rate alarm:           (disabled)

 low/high alarm: dflt:   1000/  5000           alarm deadband:                0

 channel status:       cal & prog OK           alarms:                high alarm

Please enter low and high scale, separated by a / mark (0/0=default).
>
Rem Prog                                          mod 8 of 17     Offline:ARDA
Change     I/O    Switch  Module  Monitor BT Data          Default          Accept
 Mode    Ovrview Channel  Edit            Tables           Config
  F1       F2       F3      F4       F5      F6              F8              F10
```

Field:	Valid Values:
Input Channel Type	Displays the input/output module channel configuration.
Input Data	Displays the value reported by the module in the BTR or CIO Read data file, in scaled units. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Signal	Displays the actual input voltage measured by the module. The I/O configuration utility uses the scaling in the BTW or CIO Write data file and channel data in the BTR or CIO Read data file to compute the signal. Depending on the data format, the software displays 3 or 4 decimal places. That precision is appropriate when you select the greatest possible scaling ranges. However, when you select a narrower scaling range (including default scaling), not all of the decimal places may be significant. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/). These values correspond to the predefined signal values of +1 V and +5 V. The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scaling values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by default scaling values, which are 1000/5000 in binary or 100/500 in BCD. If low scale is higher than high scale, the low alarm must also be higher than the high alarm.
Filter Constant	Enter a value: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.1 second increments) • If the data format is BCD, enter a value between 0.1 and 9.9 seconds (0.1 second increments) The default is 0 (no filtering).
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled you can edit the low/high alarm, alarm deadband and rate alarm. The module reports these conditions, as well as overrange and underrange, if they occur. The processor must be in Run mode if you want to receive current data from the module.

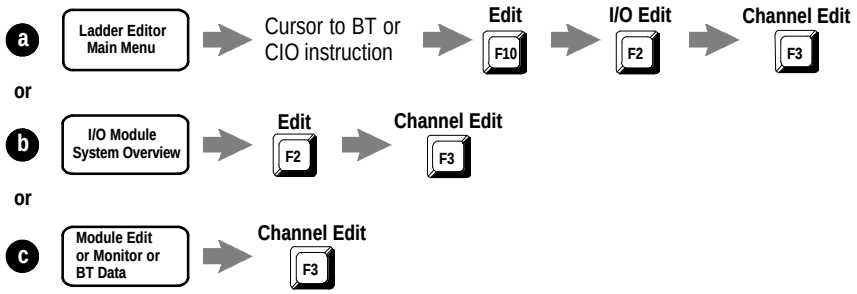
(Continued)

Field:	Valid Values:
Rate Alarm	Only available if alarms are enabled: Enter a value in scaled units per second. The rate alarm cannot be less than 0.04% or more than 50% of full scale. Enter 0 to disable.
Low/High Alarm	Only available if alarms are enabled: Enter values in scaled units for low and high alarms separated by a (/). You cannot set alarm values below 0.8 V or above 5.2 V. When you enter alarms, the screen displays `user` and the alarm values. If you enter 0/0 to select default low and high alarms, the screen displays `dflt` followed by default alarm values, which are equal to the current low and high scale values. If low scale is higher than high scale, low alarm must be higher than high alarm.
Alarm Deadband	Only available if alarms are enabled: Enter a value. It must be less than half of the difference between the low and high alarms and cannot exceed 255 (99 for BCD).
Channel Status	Displays the status of calibration and programming for this channel. The status reflects the latest values read from the BTR or CIO Read file. The processor must be in Run mode if you want to receive current data from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current data from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 10 V input

Choose one:




```
N Series/A                  Channel 7 Edit                          R G M: 3 1 1

                          input channel type: +/  10 V

 input data:                     4000          signal:                 6.0000 V

 low/high scale: user:       0/ 20000          filter const:             .0 sec
 ( 10 V / +10 V)

 alarms are:                  enabled          rate alarm:            (disabled)

 low/high alarm: dflt:       0/ 20000          alarm deadband:                0

 channel status:        cal & prog OK          alarms:                     none

Please enter low and high scale, separated by a / mark (0/0=default).
>
Rem Prog                                          mod 7 of 17     Offline:ARDA
Change     I/O    Switch  Module  Monitor BT Data         Default         Accept
 Mode    Ovrview Channel  Edit           Tables          Config
  F1       F2      F3      F4      F5      F6              F8              F10
```

Field:	Valid Values:
Input Channel Type	Displays the input/output module channel configuration.
Input Data	Displays the value reported by the module in the BTR or CIO Read data file, in scaled units. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Signal	Displays the actual input voltage measured by the module. The I/O configuration utility uses the scaling in the BTW or CIO Write data file and channel data in the BTR or CIO Read data file to compute the signal. Depending on the data format, the software displays 2 or 4 decimal places. That precision is appropriate when you select the greatest possible scaling ranges. However, when you select a narrower scaling range (including default scaling), not all of the decimal places may be significant. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/). These values correspond to the predefined signal values of +10 V and 10 V. The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scale values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by default scale values, which are 10000/10000 in binary or 100/100 in BCD. Low scale can be higher than high scale. In this case, the low alarm must also be higher than the high alarm.
Filter Constant	Enter a value: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.1 second increments) • If the data format is BCD, enter a value between 0.1 and 9.9 seconds (0.1 second increments)
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled you can edit the low/high alarm, alarm deadband and rate alarm. The module reports these conditions, as well as overrange and underrange, if they occur.

(Continued)

Field:	Valid Values:
Rate Alarm	Only available if alarms are enabled: Enter a value in scaled units per second. The rate alarm cannot be less than 0.04% or more than 50% of full scale. Enter 0 to disable.
Low/High Alarm	Only available if alarms are enabled: Enter values in scaled units for low and high alarms separated by a (/). You cannot set alarms below 10.4 V or above 10.4 V. When you enter alarms, the screen displays `user` and the alarm values. If you enter 0/0 to select default low and high alarms, the screen displays `dflt` followed by default alarm values, which are equal to the current low and high scale values. If low scale is higher than high scale, low alarm must be higher than high alarm.
Alarm Deadband	Only available if alarms are enabled: Enter a value. It must be less than half of the difference between the low and high alarms and cannot exceed 255 (99 for BCD).
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current data from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current data from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 55 mV thermocouple input

Choose one:

a. Ladder Editor Main Menu → Cursor to BT or CIO instruction → Edit (F10) → I/O Edit (F2) → Channel Edit (F3)

or

b. I/O Module System Overview → Edit (F2) → Channel Edit (F3)

or

c. Module Edit or Monitor or BT Data → Channel Edit (F3)

```
N Series/A                  Channel 3 Edit                        R G M: 3 1 1

                          thermocouple type: 55 mV

 input data:                      200          signal:                2.000  mV

 low/high scale: dflt:    500/  5500          filter const:            8.5 sec
 ( 5 / +55 mV)

 alarms are:                  enabled          rate alarm:          200 per sec

 low/high alarm: user:    500/  5500          alarm deadband:              250

 channel status:       cal & prog OK          alarms:     low alarm/rate alarm

Press F9(Toggle) to change thermocouple mode and type.

Rem Prog                                          mod 7 of 17     Offline:ARDA
Change     I/O   Switch  Module  Monitor BT Data         Default Toggle  Accept
 Mode    Ovrview Channel  Edit           Tables          Config
  F1       F2      F3      F4      F5      F6              F8      F9      F10
```

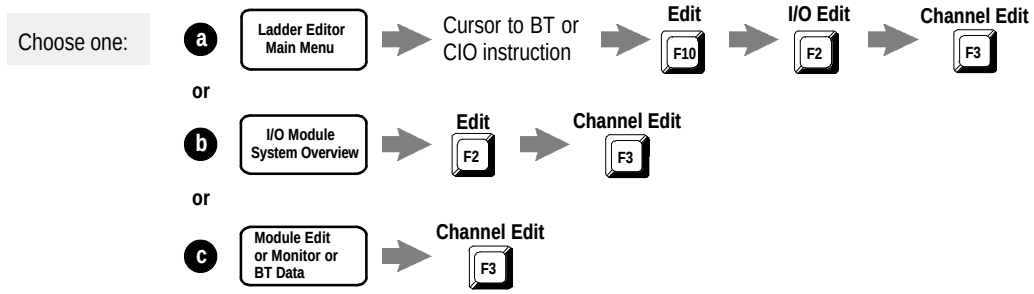
Field:	Valid Values:
Thermocouple Type	Press [F9] Toggle to select among 55 mV, B, C, E, J, K, N, R, S, T. The default is 55 mV.
Input Data	Displays the value reported by the module in the BTR or CIO Read data file in scaled units. The processor must be in Run mode if you want to receive current data from the module.
Signal	Displays the actual input voltage or temperature measured by the module. The I/O configuration utility uses the scaling in the BTW or CIO Write data file and channel data in the BTR or CIO Read data file to compute the signal. The display shows 0-3 decimal places depending on data format (BCD or binary) and channel mode (mV or degrees). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/). The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scale values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by the default scale values, which are: • in mV mode: binary: 500/5500 BCD: 50/550 • for types B, E, J, K, N, R, S, T: binary: 3000/18000 in Celsius, 5080/32720 in Fahrenheit BCD: 30/180 in Celsius, 51/327 in Fahrenheit • for type C: binary: 3000/25000 in Celsius, 508/4532 in Fahrenheit BCD: 30/250 in Celsius, 51/453 in Fahrenheit Low scale can be higher than high scale. In this case, the low alarm must also be higher than the high alarm.
Filter Constant	Enter a value: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.1 second increments) • If the data format is BCD, enter a value between 0.1 and 9.9 seconds (0.1 second increments) The default is 0 (no filtering).

(Continued)

Field:	Valid Values:
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled you can edit the low/high alarm, alarm deadband and rate alarm. The module reports these conditions, as well as overrange and underrange, if they occur.
Rate Alarm	If alarms are enabled: Enter a value in scaled units per second. The rate alarm cannot be less than 0.04% or more than 50% of full scale. Enter 0 to disable.
Low/High Alarm	If alarms are enabled: Enter values in scaled units for low and high alarms separated by a (/). You cannot set alarms outside the operating range of the channel. When you enter alarms, the screen displays `user` and the alarm values. If you enter 0/0 to select default low and high alarms, the screen displays `dflt` followed by the default alarm values. In millivolt mode, the default alarms are equal to the current low and high scale values. In degree modes, the default alarms are the scaled equivalents of the operating limits for the selected thermocouple type. If low scale is higher than high scale, low alarm must be higher than high alarm.
Alarm Deadband	If alarms are enabled: Enter a value. It must be less than half of the difference between the low and high alarms and cannot exceed 255 (99 for BCD). The default is 0.
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if want to receive current status from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 100 mV thermocouple input




```
N Series/A                  Channel 5 Edit                        R G M: 3 1 1

                          thermocouple type: type J

 input data:                    4520          signal:              452.00   C

 low/high scale: dflt:   3000/ 18000          filter const:             .0 sec
 ( 300 / +1800 C)

 alarms are:                 enabled          rate alarm:          100 per sec

 low/high alarm: dflt:   2100/ 12000          alarm deadband:               0

 channel status:       cal & prog OK          alarms:                    none

Press F9(Toggle) to change thermocouple mode and type.

Rem Prog                                        mod 7 of 17     Offline:ARDA
Change    I/O   Switch  Module  Monitor BT Data         Default Toggle  Accept
 Mode   Ovrview Channel  Edit           Tables          Config
  F1      F2      F3      F4      F5      F6              F8      F9      F10
```

Field:	Valid Values:
Thermocouple Type	Press [F9] Toggle to select among 100 mV, B, E, J, K, R, S, T. The default is 100 mV.
Input Data	Displays the value reported by the module in the BTR or CIO Read data file in scaled units. The value shown reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Signal	Displays the actual input voltage or temperature measured by the module. The I/O configuration utility uses the scaling in the BTW or CIO Write data file and channel data in the BTR or CIO Read data file to compute the signal. The display shows 0-3 decimal places depending on data format (BCD or binary) and channel mode (mV or degrees). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/). The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scale values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by the default scale values, which are: • in mV mode: binary: 10000/10000 BCD: 100/100 • for types B, E, J, K, R, S, T: binary: 3000/18000 in Celsius, 5080/32720 in Fahrenheit BCD: 30/180 in Celsius, 51/327 in Fahrenheit Low scale can be higher than high scale. In this case, the low alarm must also be higher than the high alarm.
Filter Constant	Enter a value: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.1 second increments) • If the data format is BCD, enter a value between 0.1 and 9.9 seconds (0.1 second increments) The default is 0 (no filtering).

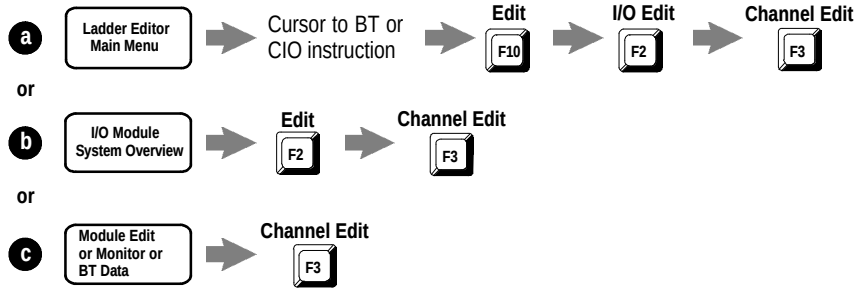
(Continued)

Field:	Valid Values:
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled you can edit the low/high alarm, alarm deadband and rate alarm. The module reports these conditions, as well as overrange and underrange, if they occur. The processor must be in Run mode if you want to receive current data from the module.
Rate Alarm	If alarms are enabled: Enter a value in scaled units per second. The rate alarm cannot be less than 0.04% or more than 50% of full scale. Enter 0 to disable.
Low/High Alarm	If alarms are enabled: Enter values in scaled units for low and high alarms separated by a (/). You cannot set alarms outside the operating range of the channel. When you enter alarms, the screen displays `user` and the alarm values. If you enter 0/0 to select default low and high alarms, the screen displays `dflt` followed by the default alarm values. In millivolt mode, the default alarms are equal to the current low and high scale values. In degree modes, the default alarms are the scaled equivalents of the operating limits for the selected thermocouple type. If low scale is higher than high scale, low alarm must be higher than high alarm.
Alarm Deadband	If alarms are enabled: Enter a value. It must be less than half of the difference between the low and high alarms and cannot exceed 255 (99 for BCD). The default is 0.
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current data from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current data from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 650 RTD input

Choose one:




```
N Series/A                  Channel 6 Edit                        R G M: 3 1 1

                    650 ohm RTD type: copper

 input data:                     1104          signal:              110.40   C

 low/high scale: dflt:   2000/  9000          filter const:             .0 sec
 ( 200 / +900 C)
                                               10 ohm offset:             .04

 alarms are:                  enabled          rate alarm:          (disabled)

 low/high alarm: user:       0/  1000          alarm deadband:             50

 channel status:        cal & prog OK          alarms:              high alarm

Press F9(Toggle) to change RTD mode and sensor type.

Rem Prog                                        mod 7 of 17     Offline:ARDA
Change    I/O   Switch  Module  Monitor BT Data         Default Toggle  Accept
 Mode   Ovrview Channel  Edit           Tables          Config
  F1      F2      F3      F4      F5      F6              F8      F9      F10
```

Field:	Valid Values:
650 RTD Type	Press [F9] Toggle to select among resistance, platinum (European standard), platinum (U.S. standard), copper, or nickel. The default is resistance.
Input Data	Displays the value reported by the module in the BTR or CIO Read data file in scaled units. The processor must be in Run mode if you want to receive current status from the module.
Signal	Displays the actual input resistance or temperature measured by the module. The I/O configuration utility uses the scaling in the BTW or CIO Write data file and channel data in the BTR or CIO Read data file to compute the signal. The display shows 0-2 decimal places depending on data format (BCD or binary) and channel mode (ohms or degrees). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/). The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scale values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by the default scale values, which are: • for resistance: binary: 10/6500 BCD: 1/650 • for temperature: binary: 2000/9000 in Celsius, 3280/16520 in Fahrenheit BCD: 200/900 in Celsius, 33/165 in Fahrenheit Low scale can be higher than high scale. In this case, the low alarm must also be higher than the high alarm.
Filter Constant	Enter a value: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.1 second increments) • If the data format is BCD, enter a value between 0.1 and 9.9 seconds (0.1 second increments) The default is 0 (no filtering).
10 Ohm Offset	If the RTD sensor type is copper, enter a variance of up to ±0.99 from 10.00 for the sensor being used (±0.79 if the data format is BCD).

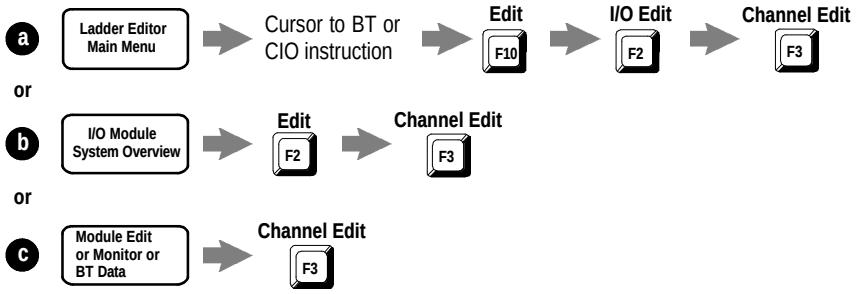
(Continued)

Field:	Valid Values:
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled you can edit the low/high alarm, alarm deadband and rate alarm. The module reports these conditions, as well as overrange and underrange, if they occur. The processor must be in Run mode if you want to receive current status from the module.
Rate Alarm	Only available if alarms are enabled: Enter a value in scaled units per second. The rate alarm cannot be less than 0.04% or more than 50% of full scale. Enter 0 to disable.
Low/High Alarm	Only available if alarms are enabled: Enter values in scaled units for low and high alarms separated by a (/). You cannot set alarms outside the operating range of the channel. When you enter alarms, the screen displays user and the alarm values. If you enter 0/0 to select default low and high alarms, the screen displays dflt followed by the default alarm values. In resistance mode, the default alarms are equal to the current low and high scale values; in temperature modes, the default alarms are the scaled equivalents of the operating limits of the channel. If low scale if higher than high scale, low alarm must be higher than high alarm.
Alarm Deadband	Only available if alarms are enabled: Enter a value. It must be less than half of the difference between the low and high alarms and cannot exceed 255 (99 for BCD).
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current status from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current status from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 20 mA sourcing/sinking input

Choose one:




```
N Series/A                    Channel 8 Edit                        R G M: 3 1 1

                    input channel type: 20mA Sourcing/Sinking

 input data:                    14200          signal:                14.2000 mA

 low/high scale: dflt:   4000/ 20000          filter const:            1.0 sec
 (4 mA / 20 mA)

 alarms are:                  enabled          rate alarm:         2000 per sec

 low/high alarm: dflt:   4000/ 20000          alarm deadband:                0

 channel status:        cal & prog OK         alarms:                     none

Please enter low and high scale, separated by a / mark (0/0=default).
>
Rem Prog                                          mod 7 of 17     Offline:ARDA
Change     I/O    Switch  Module  Monitor BT Data          Default          Accept
 Mode    Ovrview Channel  Edit            Tables           Config
  F1       F2       F3      F4       F5       F6              F8              F10
```

Field:	Valid Values:
Input Channel Type	Displays the input/output module channel configuration.
Input Data	Displays the value reported by the module in the BTR or CIO Read data file in scaled units. The processor must be in Run mode if you want to receive current status from the module.
Signal	Displays the actual input current measured by the module. The I/O configuration utility uses the scaling in the BTW or CIO Write data file and channel data in the BTR or CIO Read data file to compute the signal. The display shows 2 or 4 decimal places depending on data format (BCD or binary). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant. This value reflects the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. To do this, enter two scale values, separated by a (/), that correspond to the predefined signal values of 4 mA and 20 mA. The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scale values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by the default scale values, which are 4000/20000 in binary or 40/200 in BCD. Low scale can be higher than high scale. In this case, the low alarm must also be higher than the high alarm.
Filter Constant	Enter a value: • If the data format is binary, enter a value between 0.1 and 10 seconds (0.1 second increments) • If the data format is BCD, enter a value between 0.1 and 9.9 seconds (0.1 second increments) The default is 0 (no filtering).
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled you can edit the low/high alarm, alarm deadband and rate alarm. The module reports these conditions, as well as overrange and underrange, if they occur. The processor must be in Run mode if you want to receive current status from the module.

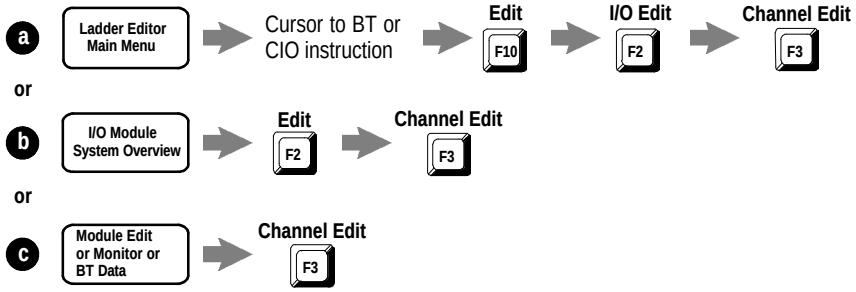
(Continued)

Field:	Valid Values:
Rate Alarm	Only available if alarms are enabled: Enter a value in scaled units per second. The rate alarm cannot be less than 0.04% or more than 50% of full scale. Enter 0 to disable.
Low/High Alarm	Only available if alarms are enabled: Enter values in scaled units for low and high alarms separated by a (/). You cannot set alarms below 3.2 mA or above 21.25 mA. When you enter alarms, the screen displays `user` and the alarm values. If you enter 0/0 to select default low and high alarms, the screen displays `dflt` followed by default alarm values, which are equal to the current low and high scale values. If low scale is higher than high scale, low alarm must be higher than high alarm.
Alarm Deadband	Only available if alarms are enabled: Enter a value. It must be less than half of the difference between the low and high alarms and cannot exceed 255 (99 for BCD). The default is 0.
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current status from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current status from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Channel Edit Screen 10 V output

Choose one:




```
N Series/A                  Channel 2 Edit                      R G M: 3 1 1

                        output channel type: +/  10 V

 output data:                       0          signal:                  .000 V

 low/high scale: user:  20000/ 20000           reset state:          user value
( 10 V / +10 V)
                                               value of output on reset:      0

 alarms are:                disabled             maximum ramp rate per second
                                               % of full scale       eng. units
 low/high clamp: dflt:  20800/ 20800                (disabled)       (disabled)

 channel status:       cal & prog OK           alarms:                     none

Please enter output value in scaled units (+/ 32767 in binary, +/ 7999 in BCD).
>
Rem Prog                                        mod 7 of 17     Offline:ARDA
Change    I/O   Switch  Module  Monitor BT Data         Default         Accept
 Mode   Ovrview Channel  Edit           Tables          Config
  F1      F2      F3      F4      F5      F6              F8              F10
```

Field:	Valid Values:
Output Channel Type	Displays the input/output module channel configuration.
Output Data [1]	Enter the value (in scaled units) to be sent to the module. If you programmed a rate limit, the output may take some time after you press [F10] Accept to reach the value shown here. During this time, if alarms are enabled, you see r a t e l i m i t in the alarms field.
Signal [1]	Enter the desired output voltage, 10.4 V to +10.4 V. If you program a rate limit, the module limits the rate of change of the output. Therefore, it might take time after accepting your edits before the actual signal value shown here is reached. During this time, if alarms are enabled, you see r a t e l i m i t in the alarms field. The signal shows 1 or 3 decimal places depending on data format (BCD or binary). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/) that correspond to the predefined signal values of 10 V and +10 V. The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays u s e r and the scale values. If you enter 0/0 to select default scaling, the screen displays d f l t followed by the default scale values, which are 10000/10000 in binary or 100/100 in BCD. Low scale can be higher than high scale. In this case, the low clamp must also be higher than the high clamp.
Reset State	Press [F9] Toggle to select among Last State, Channel Minimum, Channel Maximum, or User Value (see next field).
Value Of Output On Reset	Only available if Reset State is User Value: Enter a value in scaled units.
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled the module sets alarm status bits for bad output data, low/high clamp, and limited rate if those conditions occur. The processor must be in Run mode if you want to receive current status from the module.

[1] Enter **either** of these two fields and the software computes the other field for you using the programmed scaling.

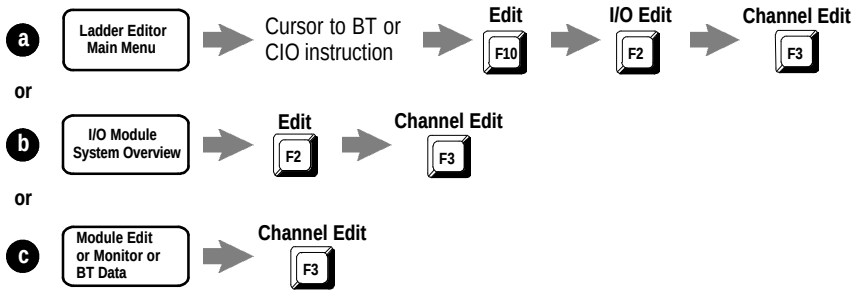
(Continued)

Field:	Valid Values:
Maximum Ramp Rate Per Second	Enter a rate limit, either as a percentage of full scale per second (1 to 200) or as a change in signal per second (0.2 to 40 in steps of 0.2). When the programmed output data changes rapidly, the module limits the actual rate of change of the output signal as indicated. If you don't want the module to impose any limit on the rate of change of the output signal, enter 0.
Low/High Clamp	The module always clamps outputs to 10.4 V. If you want a narrower clamping range, enter the low and high clamps in scaled units, separated by a (/). The software displays u s e r followed by the values you entered. Or, enter 0/0 to use the default clamps. The software displays d f l t followed by the scaled equivalent of 10.4 V and 10.4 V. If low scale is higher than high scale, the low clamp must be higher than the high clamp.
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current status from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current status from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Channel Edit Screen 25 mA output

Choose one:




```
N Series/A                Channel 1 Edit                        R G M: 3 2 0

                        output channel type: 0 25 mA

 output data:                  6450          signal:                 6.450 mA

 low/high scale: dflt:   4000/ 20000         reset state:          last state
 (4 mA / 20 mA)

 alarms are:                 enabled           maximum ramp rate per second
                                              % of full scale       eng. units
 low/high clamp: dflt:       0/ 26000              25 % of FS          4.00 mA

 channel status:       cal & prog OK         alarms:                    none

Please enter output value in scaled units (+/ 32767 in binary, +/ 7999 in BCD).
>
Rem Prog                                      mod 8 of 17     Offline:ARDA
Change    I/O   Switch  Module  Monitor BT Data         Default         Accept
 Mode   Ovrview Channel  Edit           Tables          Config
  F1      F2      F3      F4      F5      F6              F8              F10
```

Field:	Valid Values:
Output Channel Type	Displays the input/output module channel configuration.
Output Data [1]	Enter the value (in scaled units) to be sent to the module. If you programmed a rate limit, the output may take some time after you press [F10] Accept to reach the value shown here. During this time, if alarms are enabled, you see `rate limit` in the alarms field.
Signal [1]	Enter the desired output current, 0 to 26 mA. If you program a rate limit, the module limits the rate of change of the output. Therefore, it might take time after accepting your edits before the actual signal value shown here is reached. During this time, if alarms are enabled, you see `rate limit` in the alarms field. The signal shows 1 or 3 decimal places depending on data format (BCD or binary). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/) that correspond to the predefined signal values of 4 mA and 20 mA. The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays `user` and the scale values. If you enter 0/0 to select default scaling, the screen displays `dflt` followed by the default scale values, which are 4000/20000 in binary or 40/200 in BCD. Low scale can be higher than high scale. In this case, the low clamp must also be higher than the high clamp.
Reset State	Press [F9] Toggle to select among Last State, Channel Minimum, Channel Maximum, or User Value (see next field).
Value Of Output On Reset	Only available if Reset State is User Value: Enter a value in scaled units.
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled the module sets alarm status bits for bad output data, low/high clamp, and limited rate if those conditions occur. The processor must be in Run mode if you want to receive current status from the module.

[1] Enter **either** of these two fields and the software computes the other field for you using the programmed scaling.

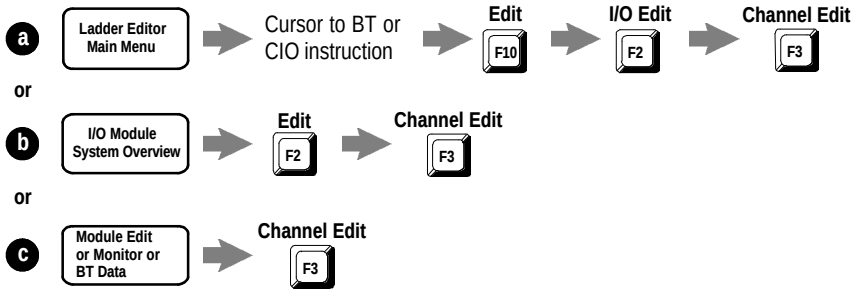
(Continued)

Field:	Valid Values:
Maximum Ramp Rate Per Second	Enter a rate limit, either as a percentage of full scale per second (1 to 200) or as a change in signal per second (up to 32 mA/s). If you enter the rate limit as a signal value, the I/O configuration utility rounds the value you entered to match the prescribed step size of 0.16 mA. When the programmed output data changes rapidly, the module limits the actual rate of change of the output signal as indicated. If you don't want the module to impose any limit on the rate of change of the output signal, enter 0.
Low/High Clamp	The module always clamps outputs to 0 mA to 26 mA. If you want a narrower clamping range, enter the low and high clamps in scaled units, separated by a (/). The software displays `user` followed by the values you entered. Enter 0/0 to use the default clamps. The software displays `dflt` followed by the scaled values that correspond to 0 mA and 26 mA. If low scale is higher than high scale, the low clamp must be higher than the high clamp.
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current status from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current status from the module.

Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Channel Edit Screen 50 mA output

Choose one:




```
N Series/A                    Channel 1 Edit                        R G M: 3 1 1

                          output channel type: 0 50 mA

 output data:                      3000          signal:       ramping   30.00 mA

 low/high scale: dflt:   1000/  5000             reset state:          last state
 (10 mA / 50 mA)

 alarms are:                    enabled             maximum ramp rate per second
                                                  % of full scale       eng. units
 low/high clamp: user:       0/  4000                 15 % of FS            6.0 mA

 channel status:         cal & prog OK             alarms:               rate limit

Please enter output value in scaled units (+/ 32767 in binary, +/ 7999 in BCD).
>
Rem Prog                                              mod 7 of 17     Offline:ARDA
Change     I/O   Switch  Module  Monitor BT Data          Default          Accept
 Mode    Ovrview Channel  Edit            Tables          Config
  F1       F2      F3      F4      F5      F6              F8               F10
```

Field:	Valid Values:
Output Channel Type	Displays the input/output module channel configuration.
Output Data [1]	Enter the value (in scaled units) to be sent to the module. If you programmed a rate limit, the output may take some time after you press [F10] Accept to reach the value shown here. During this time, if alarms are enabled, you see `rate limit` in the alarms field.
Signal [1]	Enter the desired output current, 0 to 51.26 mA. If you program a rate limit, the module limits the rate of change of the output. Therefore, it might take time after accepting your edits before the actual signal value shown here is reached. During this time, if alarms are enabled, you see `rate limit` in the alarms field. The signal shows 1 or 2 decimal places depending on data format (BCD or binary). That precision is appropriate when the greatest possible scaling ranges are selected. However, when you select a narrower scaling range (including default scaling), not all the decimal places may be significant.
Low/High Scale	Scaling lets you convert the input signal to units that fit your application. Enter values for low and high scaling separated by a (/) that correspond to the predefined signal values of 10 mA and 50 mA. The values you enter can be from 32768 to +32767 in twos complement binary, or 7999 to +7999 in BCD. When you enter scaling, the screen displays `user` and the scale values. If you enter 0/0 to select default scaling, the screen displays `dflt` followed by the default scale values, which are 1000/5000 in binary or 100/500 in BCD. Low scale can be higher than high scale. In this case, the low clamp must also be higher than the high clamp.
Reset State	Press [F9] Toggle to select among Last State, Channel Minimum, Channel Maximum, or User Value (see next field).
Value Of Output On Reset	Only available if Reset State is User Value: Enter a value in scaled units.
Alarms Are	Press [F9] Toggle to select Enabled or Disabled (the default is Disabled): • Disabled no alarm status bits are set by the module. • Enabled the module sets alarm status bits for bad output data, low/high clamp, and limited rate if those conditions occur. The processor must be in Run mode if you want to receive current status from the module.

[1] Enter **either** of these two fields and the software computes the other field for you using the programmed scaling.

(Continued)

Field:	Valid Values:
Maximum Ramp Rate Per Second	Enter a rate limit, either as a percentage of full scale per second (1 to 200) or as a change in signal per second (up to 80 mA/s). If you enter the rate limit as a signal value, the I/O configuration utility rounds the value you enter to match the prescribed step size of 0.4 mA. When the programmed output data changes rapidly, the module limits the actual rate of change of the output signal as indicated. If you don't want the module to impose any limit on the rate of change of the output signal, enter 0.
Low/High Clamp	The module always clamps outputs to 0 mA to 51.26 mA. If you want a narrower clamping range, enter the low and high clamps in scaled units, separated by a (/). The software displays `user` followed by the values you entered. Enter 0/0 to use the default clamps. The software displays `dflt` followed by the scaled values that correspond to 0 mA and 51.26 mA. If low scale is higher than high scale, the low clamp must be higher than the high clamp.
Channel Status	Displays the status of calibration and programming for this channel. The processor must be in Run mode if you want to receive current status from the module.
Alarms	Displays the status bits for alarms. If all alarms are reset, NONE appears. The processor must be in Run mode if you want to receive current status from the module.

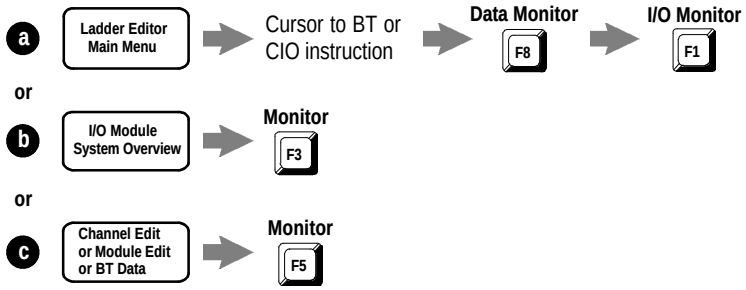
Use **[PageUp]** or **[PageDown]** to configure other channels. Press **[F4] Module Edit** for other configuration choices or **[F10] Accept** to accept your edits. We suggest you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring an N-Series Analog Module

Use the monitor screen to check and verify the configuration data. The data and status shown reflect the latest values read from the BTR or CIO Read data file. The processor must be in Run mode if you want to receive current status from the module. Follow the steps below.

Monitor Screen N-Series Analog

Choose one:




```
N Series/A                      Monitor                          R G M: 3 2 0

                 write BT      read BT       Module status:
control file:  N12:290       N12:295                          alarm
   data file:  N12:230       N12:300
 data length:  59            28

     ch     description        addr/symbol    data         channel status
         Cold junctn temp          N12:303   25.03 C             ok
      1  out  0 25 mA              N12:231    6450               ok
      2  out  0 25 mA              N12:232   11500               ok
      3  in   +/  5 V              N12:309    5100               hi
      4  in   +/  5 V              N12:311    5200             OR hi
      5  in   +/  5 V              N12:313       0               ok
      6  in   +/  5 V              N12:315    1067               RA
      7  in   +/  5 V              N12:317       0               ok
      8  in   +/  5 V              N12:319       0               ok

Select a channel; press a function key for editing.
>
Rem Prog                                          mod 8 of 17     Offline:ARDA
Change     I/O    Channel Module          BT Data Display
 Mode    Ovrview  Edit    Edit           Tables  Symbols
  F1       F2      F3      F4              F6      F7
```

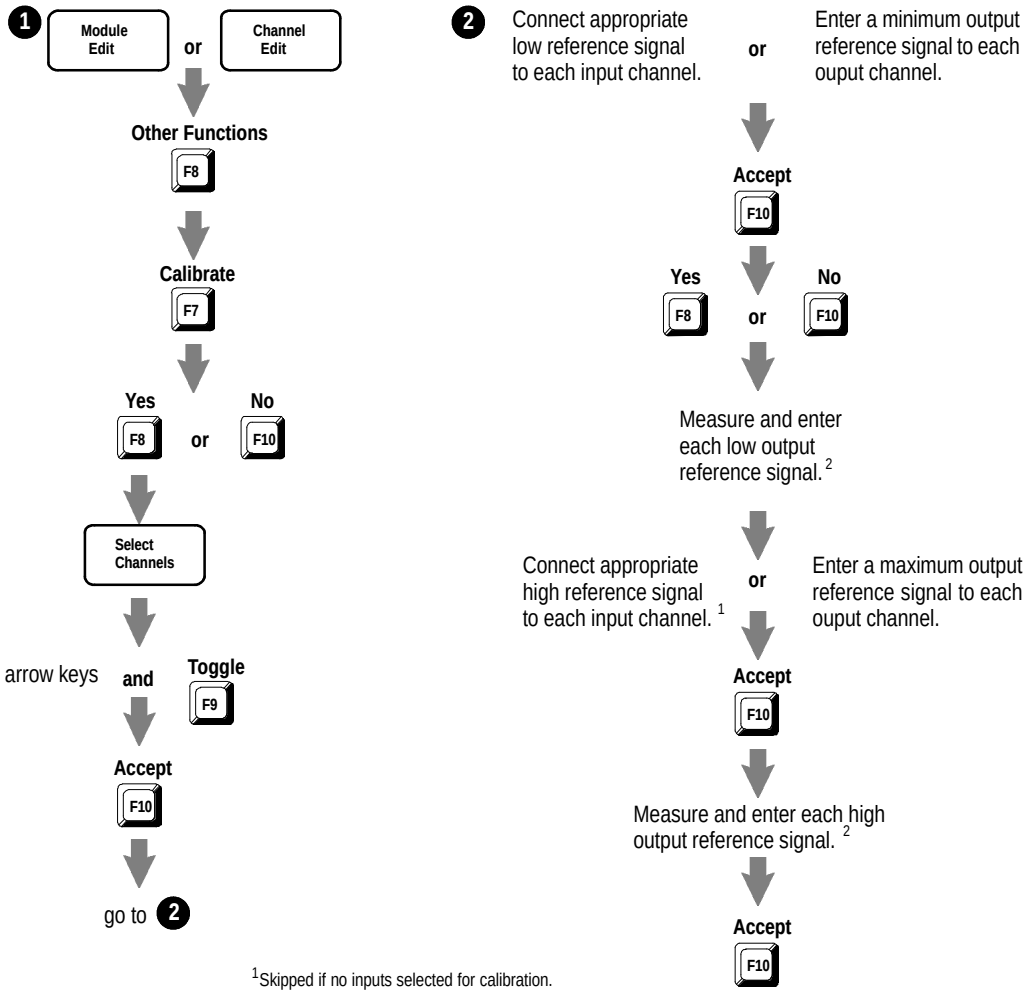
Field:	Displays this Information:
Write BT	Control and data file addresses and data file length for the BTW or CIO Write instruction.
Read BT	Control and data file addresses and data file length for the BTR or CIO Read instruction.
Module Status	One of the following appears: fault, RTS-timeout, NZ (one or more reserved fields in the BTW or CIO Write data file contain nonzero values), alarm, bad-program, bad-chnl-data, bad-BT-struc, pgm-verified or pgm-no-verify, power-up, and I/O-reset.
Channel	Index number of a channel. If you press [F3] - Channel Edit, the software displays the channel configuration screen for the currently highlighted channel.
Description	Description of the input/output residing on the channel.
Address/Symbol	Displays the logical address (or the symbol) of the value in the Data field.
Data	Displays online data for each of the module's channel from the module. The data is read from the module's BTR or CIO Read data file (for inputs) or the BTW or CIO Write file (for outputs).
Channel Status	Displays the status of the channel: • ok channel is correctly calibrated and programmed, and no alarm conditions are reported • OR, UR overrange or underrange • lo, hi for input channels, the input signal is outside of the alarm range; for output channels, the signal has been clamped • RA for input channels, rate alarm; for output channels, the programmed ramp rate is currently limiting the output • data you selected BCD format, but the output data word for this channel is not valid BCD • bad cal channel has not been calibrated (or the calibration is not correct) • bad pgm programming for that channel (in the BTW or CIO Write data file) contained errors If any of the following status codes appear, your module is not working properly: NZ, OU, hl.

Calibrating an N-Series Analog Module

You must be connected to a processor to calibrate a module. To calibrate an N-Series analog module, see Figure 3.3. (The example shown calibrates a combination of input and output channels.)

Depending on the types of channels you want to calibrate (input, output, or a combination of input and output), the I/O configuration utility prompts you for the appropriate reference signals.

Figure 3.3
Using the Calibration Screen



The Calibration Status screen appears automatically after you complete the calibration. The status column displays `done` if the calibration was successful, or `bad cal` if the calibration was not successful.

4 Configuring the Very High Speed Counter Module (1771-VHSC) and Configurable Flow Meter Module (1771-CFM)

Chapter Objectives

This chapter explains how to configure the Very High Speed Counter and Configurable Flow Meter I/O modules. You should have already read chapter 1 because it explains the basic functions and screens you'll use.

Configuring an I/O Module

When you edit a module configuration, you can change the BTW or CIO Write information associated with a module, accept those changes, and then initiate the block transfer or ControlNet I/O transfer.

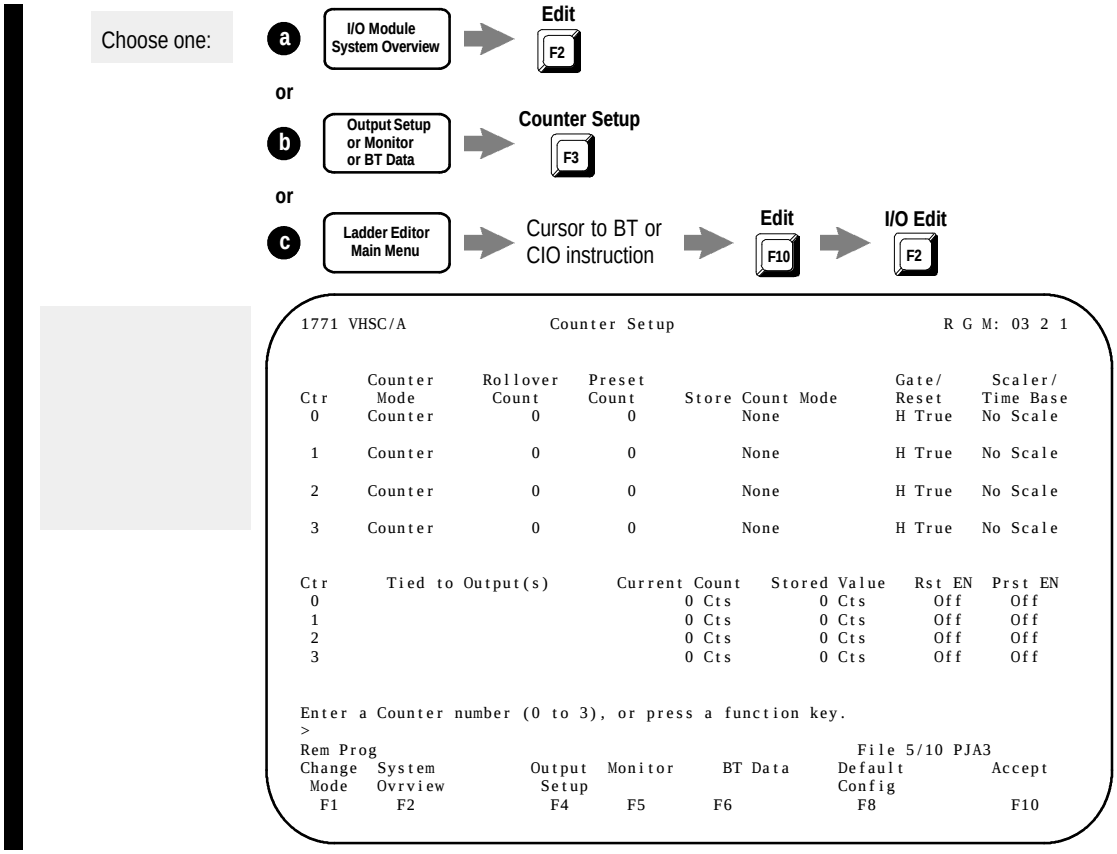
Editing Module Configuration

For Information about Configuring this Module:	See Page:
1771-VHSC	4-2
1771-CFM	4-11

Configuring 1771-VHSC Series A

To configure a 1771-VHSC series A module, follow the steps below.

Counter Setup Screen 1771-VHSC


Choose one:
a
I/O Module System Overview
Edit
F2
or
b
Output Setup or Monitor or BT Data
Counter Setup
F3
or
c
Ladder Editor Main Menu
Cursor to BT or CIO instruction
Edit
F10
I/O Edit
F2
1771 VHSC/A Counter Setup R G M: 03 2 1
Ctr Counter Mode Rollover Count Preset Count Store Count Mode Gate/ Reset Scaler/ Time Base
0 Counter 0 0 None H True No Scale
1 Counter 0 0 None H True No Scale
2 Counter 0 0 None H True No Scale
3 Counter 0 0 None H True No Scale
Ctr Tied to Output(s) Current Count Stored Value Rst EN Prst EN
0 0 Cts 0 Cts Off Off
1 0 Cts 0 Cts Off Off
2 0 Cts 0 Cts Off Off
3 0 Cts 0 Cts Off Off
Enter a Counter number (0 to 3), or press a function key.
>
Rem Prog File 5/10 PJA3
Change Mode F1
System Ovrview F2
Output Setup F4
Monitor F5
BT Data F6
Default Config F8
Accept F10

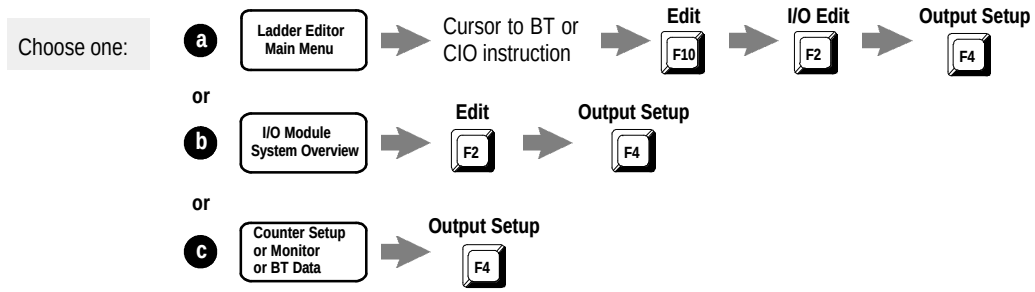
Field:	Valid Values:
Ctr	Displays counter channel numbers. Enter 0 to 3 or use up/down arrow keys to move to the line for that channel.
Counter Mode	[F9] Toggle switches through: • Counter the counter channel reads incoming pulses on channel A from single-phase outputs while sensing direction from channel B and the puts the count in the read block transfer or ControlNet I/O transfer data. • Encoder x1 the counter reads incoming pulses from 2-phase quadrature outputs and puts the count in the read block transfer or ControlNet I/O transfer data; counts on the leading edges of channel A and senses direction on channel B. • Encoder x4 the counter reads incoming pulses from 2-phase quadrature outputs and puts the count in the read block transfer or ControlNet I/O transfer data; counts on leading and trailing edges of channel A and B and senses direction from channel B. • Ch Not Used channel not used. • Period Rate the counter channel performs period rate counting by gating the 4 MHz internal clock signal with an external signal at the gate reset input; the count, frequency and outputs are updated at the end of a falling edge of a gate reset pulse. • Rate Meas the counter channel will calculate the frequency of an external signal on channel A, based on a selectable time base and returns count and frequency in the read block transfer or ControlNet I/O transfer. • Cont. Rate the counter channel performs continuous rate counting by gating the 4 MHz internal clock signal with an external signal at the gate reset input; the count and frequency are updated at the end of a selectable number of pulses. The outputs are updated constantly. The default is Counter.
Rollover Count	Only available in Counter and Encoder modes: Enter a value between 0 and 999,999 so that the count rolls over. This value must be greater than the value in the Preset Count field. The default is 999,999.
Preset Count	Only available in Counter and Encoder modes: Enter a value (0 to 999,999) to initialize the counter on demand. This value must be less than the Rollover Count. The default is 0. You can assign a preset value here, but you cannot actually enable or disable the preset through the I/O configuration utility. The only way to load a preset value into a counter is for your PLC program to set the appropriate bit in the BTW or CIO Write data file (BTW or CIO Write word 1 bits 8-11).

(Continued)

Field:	Valid Values:
Store Count Mode	Only available in Counter and Encoder modes. [F9] Toggle switches through: • None No store count mode selected • Store-Continue on the rising edge of the gate signal, saves the current count into the stored count field and continues counting • Store-Wait\Resume on the rising edge of the gate signal, saves the current count into the stored count field, stops counting until the Gate/Reset changes states, then resumes counting • Store-Reset-Wait\Start on the rising edge of the gate signal, saves the current count into the stored count field, resets the counter to zero, then waits until the Gate/Reset changes state to begin counting • Store-Reset-Start saves the current count into the stored count field, resets the counter to zero, and begins counting The default is None. When you select a counter mode of Period Rate, Rate Meas, or Cont Rate, the software sets the store count mode to none and won't let you edit it.
Gate/Reset	Press [F9] to toggle between: H-True and L-True to invert the Gate/Reset signal for the counter. The default is H-True. Not available when the Counter is in Rate Meas mode or when the Store Count Mode is None in Counter or Encoder modes.
Scaler/Time Base	In Counter, Encoder, Period Rate and Continuous modes: • enter a scale value to divide the Gate/Reset signal by: 1, 2, 4, 8, 16, 32, 64, or 128 (default: 0=No Scale) Counter and Encoder modes are only valid if the Store Count mode is not None. In Rate Meas mode: • enter a time base to calculate the frequency of channel A 10 to 2000 ms in 10 ms increments (0 = 1 s; default = 1 s)
The remaining fields are display only.	
Ctr	Displays the counter channel numbers.
Tied to Outputs	Displays any outputs tied to a counter channel. (You can set these on the Output Setup screen.)
Current Count	Displays the current count value for each counter channel. The processor must be in Run mode if you want to receive current status from the module.
Stored Value	Displays the stored value for each counter channel (count value for Counter and Encoder modes; Hz for Period, Rate Measure and Continuous Rate modes). The processor must be in Run mode if you want to receive current status from the module.
Reset Enable	Displays the status of the Reset Enable bit for each counter channel in the BT or CIO data file. This field cannot be edited from the I/O configuration utility. You must enable or disable reset through a program running in the PLC processor.
Preset Enable	Displays the status of the Preset Enable bit for each counter channel in the BT or CIO data file. This field cannot be edited from the I/O configuration utility. You must enable or disable preset through a program running in the PLC processor.

Press **[F4] Output Setup** to continue the configuration or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Output Setup Screen 1771-VHSC




```
1771 VHSC/A              Output Setup                        R G M: 03 2 1

 Output   Tied to     Count Value     On Count    Off Count    Config     State
   0        None          N/A           0 Cts       0 Cts    Disabled    Off

   1        None          N/A           0 Cts       0 Cts    Disabled    Off

   2        None          N/A           0 Cts       0 Cts    Disabled    Off

   3        None          N/A           0 Cts       0 Cts    Disabled    Off

   4        None          N/A           0 Cts       0 Cts    Disabled    Off

   5        None          N/A           0 Cts       0 Cts    Disabled    Off

   6        None          N/A           0 Cts       0 Cts    Disabled    Off

   7        None          N/A           0 Cts       0 Cts    Disabled    Off


Enter an Output number (0 to 7), or press a function key.
>
Rem Prog                                                    5/10 File PJA3
Change  System  Counter          Monitor                  Default        Accept
 Mode   Ovrview  Setup                                    Config
  F1      F2      F3               F5                       F8             F10
```

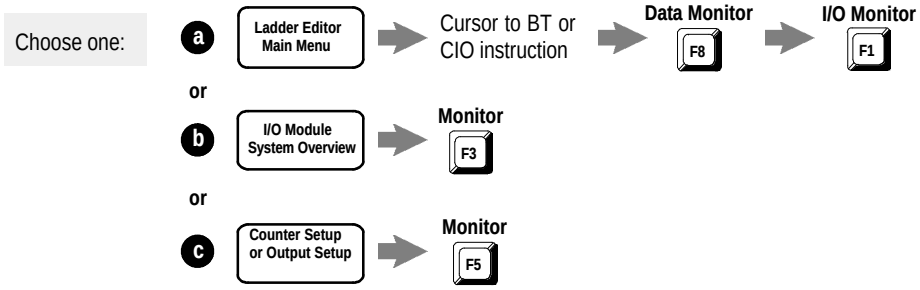
Field:	Valid Values:
Output	Displays the output channel numbers. Enter a value between 0 and 7 or use the up/down arrow keys to move to the line for that channel.
Tied to	[F9] Toggle switches through: • None do not tie a counter channel to an output channel • Counter 0 tie counter channel 0 to the current output channel • Counter 1 tie counter channel 1 to the current output channel • Counter 2 tie counter channel 2 to the current output channel • Counter 3 tie counter channel 3 to the current output channel The default is None. If an output is tied to a counter in Rate Meas mode, the On and Off Count values must not exceed 500,000 Hz.
Count Value	Displays the count or value that the module uses, with the On Count and Off Count, to decide whether to turn the output on or off. In Rate Measurement mode, this is the frequency value (BTR or CIO Read words 11-18); in all other modes, this is the current counter value (BTR or CIO Read words 3-10).
On Count and Off Count	Use the On Count and Off Count with the Config field (see below) to determine the on/off cycle of the output channel. If the output is Enabled, it turns ON when the current count or frequency reaches the On Count, and turns OFF when the current count or frequency reaches the Off Count. The On Count may be greater or less than the Off Count. Valid values for the On Count and Off Count depend on the mode of the counter that this output is tied to: • If the counter is in Counter mode, Encoder mode, Period Rate mode, or Cont. Rate mode, enter values from 0 to 999,999 counts. The module compares the current count (BTR or CIO Read words 3-10) to these On and Off Counts. • If the counter is in Rate Meas mode, enter values from 0 to 500,000 Hz for the On Count and the Off Count. The module compares the frequency (stored value, BTR or CIO Read words 11-18) to these On and Off Counts. The On Count and the Off Count are ineffective if the Config field shows Disabled or Forced On. The I/O configuration utility does not view this as a problem because some applications use the PLC program to alter the Config bits in the BTW or CIO Write data file. If your program doesn't do this, make sure you set the Config field on this screen when you set nonzero On Count and Off Count.
Config	[F9] Toggle switches through: • Disable forces the output to an OFF state by setting the output enable to zero • Forced On forces the output to an ON state by setting the force and enable to 1 • Enable allows the On Count, Off Count, and Count Value to determine the ON/OFF cycle of the output by setting the enable to 1 The default is Disable. The On Count and Off Count are ineffective if the Config field shows disabled or Forced On. The I/O configuration utility will not diagnose this condition as a problem, because some applications use the PLC program to alter the config bits in the BTW or CIO Write data file.
State	Displays the output state of the current output channel (ON or OFF). The processor must be in Run mode if you want to receive current status from the module.

Press **[F3] Counter Setup** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-VHSC Series A

Use the Monitor screen to check and verify the configuration data. The Monitor screen for the 1771-VHSC module is divided into **two** screens. Input status and data reflect the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current status from the module. Configuration data copied from the Counter Setup and Output Setup screens to the Monitor screens are the values from the BTW or CIO Write file on the processor, and do not reflect any pending edits that you have not yet accepted. Follow the steps below.

Monitor Screen 1771-VHSC




```
1771 VHSC/A                Monitor                              R G M: 03 2 1


     Counter  Rollover Preset                          Current  Stored  Scaler/
Ctr    Mode      Count   Count     Store Count Mode      Count   Value  Time Base
0    Counter         0       0           None                0       0  No Scale
1    Counter         0       0           None                0       0  No Scale
2    Counter         0       0           None                0       0  No Scale
3    Counter         0       0           None                0       0  No Scale

 Output   Tied to      Count Value     On Count     Off Count     Config      State
   0        None           N/A          0 Cts         0 Cts    Disabled      Off
   1        None           N/A          0 Cts         0 Cts    Disabled      Off
   2        None           N/A          0 Cts         0 Cts    Disabled      Off
   3        None           N/A          0 Cts         0 Cts    Disabled      Off
   4        None           N/A          0 Cts         0 Cts    Disabled      Off
   5        None           N/A          0 Cts         0 Cts    Disabled      Off
   6        None           N/A          0 Cts         0 Cts    Disabled      Off
   7        None           N/A          0 Cts         0 Cts    Disabled      Off


Press Page Down to view current VHSC status.                          1 of 2
>
Rem Prog                                                    5/10 File PJA3
Change  System  Counter Output  Other          Display
 Mode   Ovrview  Setup   Setup   Monitor        Symbols
  F1      F2      F3      F4      F5             F7
```

Displays the count or value that the module uses, with the On Count and Off Count, to decide whether to turn the output on or off. In Rate Meas mode, this is the frequency value (BTR or CIO Read words 11-18); in all other modes, this is the current counter value (BTR or CIO Read words 3-10).

Field (Monitor 1 of 2):	Valid Values:
Ctr	Displays the counter channel (0 to 3).
Counter Mode	Displays the counter mode you configured on the Counter Setup screen. The value shown on the Monitor screen is the value from the BTW or CIO Write data file on the processor, and does not reflect any pending edits that you have not yet accepted.
Rollover Count	Displays the rollover count value you configured on the Counter Setup screen.
Preset Count	Displays the preset you configured on the Counter Setup screen.
Store Count Mode	Only valid in Counter or Encoder modes. Displays the store count mode you configured on the Counter Setup screen.
Current Count	Displays the current count value of the counter.
Stored Value	Displays the stored count (Hz for Rate Meas mode, counts for all other modes).
Scaler/Time Base	Displays the scaler or time base depending on the counter mode as entered on the Counter Setup screen.
Output	Displays the output channel (0 to 7).
Tied to	Displays which counter channel the output is tied to (see the Output Setup screen).
Count Value	Displays the count or value that the module uses, with the On Count and Off Count, to decide whether to turn the output on or off. In Rate Meas mode, this is the frequency value (BTR or CIO Read words 11-18); in all other modes, this is the current counter value (BTR or CIO Read words 3-10).
On Count	Displays the configured ON value from the Output Setup screen.
Off Count	Displays the configured OFF value from the Output Setup screen.
Config	Displays how you have that output configured on the Output Setup screen (Disabled, Enabled, Forced On).
State	Displays the output state of the current channel (ON or OFF).

If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).

```
1771 VHSC/A                Monitor                              R G M: 03 2 1


          BTW           BTR        Reset      Preset    Gate/Reset  Gate/Reset
Ctr  New Data Ack  New Data      Enable     Enable      Config      Signal
 0         No       Old Data      Reset      Reset       H True     Inactive
 1         No       Old Data      Reset      Reset       H True     Inactive
 2         No       Old Data      Reset      Reset       H True     Inactive
 3         No       Old Data      Reset      Reset       H True     Inactive

Power up Status:  A successful BTW has occurred since module start up.

 Program Status:  No Program Errors

  PLC Addresses:
                                    Write BT      Read BT
                     Control File:    N12:100      N15:105
                        Data File:      N39:2        N10:25
                  Data File Length:     64           18

Press Page Up to view counter and output information.                2 of 2
>
Rem Prog                                                        5/10 File PJA3
Change   System  Counter Output    Other         Display
 Mode    Ovrview  Setup   Setup   Monitor       Symbols
  F1       F2       F3      F4       F5            F7
```

Field (Monitor 2 of 2):	Displays this Information:
Ctr	Displays the counter channel (0 to 3).
BTW New Data ACK	Your ladder program can acknowledge new data sent from the module by setting the data ACK bit for a particular channel. This field displays: YES when your program sends an acknowledgement to the VHSC module; NO when no acknowledgement is sent. This field is controlled by your ladder program and is display only.
BTR New Data	After new data has been acknowledged (ACK sent to the VHSC module), the module reports the data for that channel as Old Data; when new data is available (data received after an ACK), the module reports the data for that channel as New Data. This field is controlled by your VHSC module and is display only.
Reset Enable	Displays whether you have enabled the counter reset. This field is controlled by your ladder program and is display only. Set: if the counter's reset bit is set (1) Reset: if the counter's reset bit is reset (0)

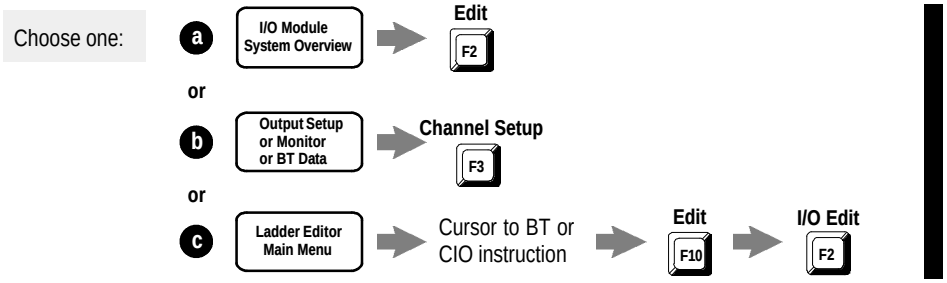
(Continued)

Field (Monitor 2 of 2):	Displays this Information:
Preset Enable	Displays whether you have enabled the counter preset. This field is controlled by your ladder program and is display only. Set: if the counter's preset bit is set (1) Reset: if the counter's preset bit is reset (0)
Gate/Reset Config	Displays your configuration of Gate/Reset (H-True, L-True).
Gate/Reset Signal	Displays the Gate/Reset signal on the Counter Setup screen (Inactive or Asserted).
Power-up Status	Displays whether a BTW or CIO Write has successfully occurred since power-up.
Program Status	Displays whether a programming error occurred with the last BTW or CIO Write sent.
PLC Addresses: Control File Data File Data File Length	Displays the addresses and lengths of the PLC files used by the module.

Configuring 1771-CFM Series A

To configure a 1771-CFM series A module, follow the steps below.

Channel Setup Screen (Channel 0, Channel 1, Channel 2, Channel 3) 1771-CFM

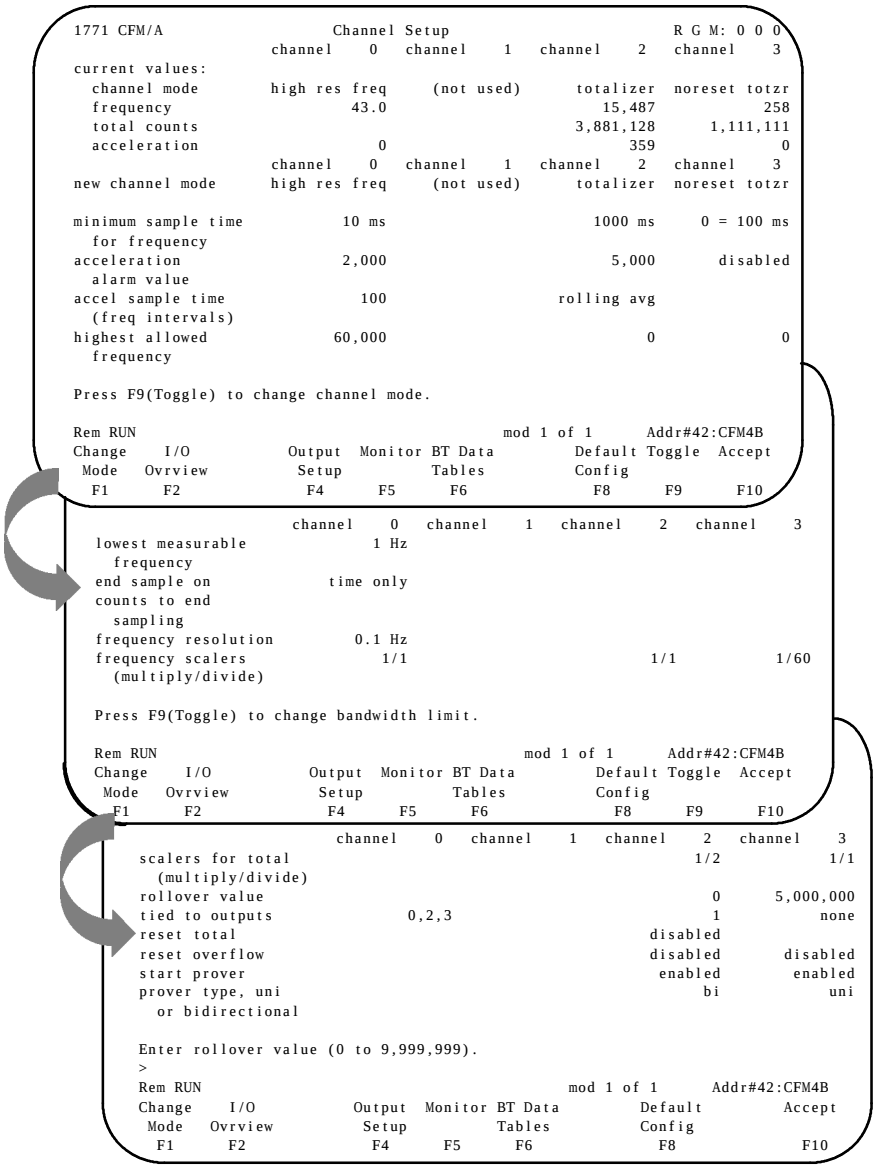


The top part of each page of the Channel Setup screen shows selected current values for each channel. These values reflect the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.

The bottom part of each page of the Channel Setup screen shows current programming for each channel and lets you change the channel programming. Fields inapplicable in the programmed channel mode are shown as dashes and cannot be edited. Follow the steps below:

Use **[PageUp]** or **[PageDown**] to move through the Channel Setup screen.

If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).


1771 CFM/A Channel Setup R G M: 0 0 0
channel 0 channel 1 channel 2 channel 3
current values:
channel mode high res freq (not used) totalizer noreset totzr
frequency 43.0 15,487 258
total counts 3,881,128 1,111,111
acceleration 0 359 0
channel 0 channel 1 channel 2 channel 3
new channel mode high res freq (not used) totalizer noreset totzr
minimum sample time for frequency 10 ms 1000 ms 0 = 100 ms
acceleration alarm value 2,000 5,000 disabled
accel sample time (freq intervals) 100 rolling avg
highest allowed frequency 60,000 0 0
Press F9(Toggle) to change channel mode.
Rem RUN mod 1 of 1 Addr#42:CFM4B
Change Mode F1 I/O Ovrview F2 Output Setup F4 Monitor BT Data Tables F5 F6 Default Config F8 Toggle F9 Accept F10
channel 0 channel 1 channel 2 channel 3
lowest measurable frequency 1 Hz
end sample on counts to end sampling time only
frequency resolution 0.1 Hz
frequency scalers (multiply/divide) 1/1 1/1 1/60
Press F9(Toggle) to change bandwidth limit.
Rem RUN mod 1 of 1 Addr#42:CFM4B
Change Mode F1 I/O Ovrview F2 Output Setup F4 Monitor BT Data Tables F5 F6 Default Config F8 Toggle F9 Accept F10
channel 0 channel 1 channel 2 channel 3
scalers for total (multiply/divide) 1/2 1/1
rollover value 0 5,000,000
tied to outputs 0,2,3 1 none
reset total disabled
reset overflow disabled disabled
start prover enabled enabled
prover type, uni or bidirectional bi uni
Enter rollover value (0 to 9,999,999).
>
Rem RUN mod 1 of 1 Addr#42:CFM4B
Change Mode F1 I/O Ovrview F2 Output Setup F4 Monitor BT Data Tables F5 F6 Default Config F8 Accept F10

Field:	Valid Values:
Current Values • Channel Mode • Frequency • Total Counts • Acceleration	Displays the following: • the current channel mode as returned in the BTR or CIO Read data file by the module • the current scaled frequency • in totalizer and nonresettable totalizer modes, the scaled total counts • the change per second in scaled frequency (only if the acceleration alarm value is nonzero)
New Channel Mode	Press [F9] Toggle to select a channel mode from this list: • not used • totalizer • nonresettable totalizer • high-resolution frequency (channels 0 and 2 only) • direction sensor (channels 0 and 2 only) The last two modes are two-channel modes. If you program channel 0 in either of these modes, the software sets channel 1 to (not used) and you cannot edit it. If you program channel 2 to a two-channel mode, the software sets channel 3 to (not used) and you cannot edit it.
Minimum Sample Time for Frequency	Enter a value of 4 to 1000 ms. The default (if you enter 0) is 100 ms in the totalizer modes and 4 ms in frequency and direction modes. In direction mode, this field is meaningful only when the lowest measurable frequency is 1/sample time.
Acceleration Alarm Value	Enter an alarm value up to 32,767. If the acceleration alarm is 0 (the default), all acceleration features of the module are disabled.
Acceleration Sample Time (Freq Intervals)	Only when the acceleration alarm is not 0: Enter a number to determine how many frequency intervals (1 to 750) should be spanned in computing acceleration. If you enter 0, acceleration is calculated as a rolling average over five frequency sampling intervals.
Highest Allowed Frequency	Enter a value up to 120,000 Hz for the overspeed threshold. Entering 0 selects the default (120,000 Hz). The highest allowed frequency is in Hz, not in scaled frequency units. For example, if you select 120,000 Hz as the highest allowed frequency and select frequency scalers of 1/60, the module sets the overspeed bit in the BTR or CIO Read for any scaled frequency above 2000 (120,000 Hz).
Lowest Measurable Frequency	Press [F9] - Toggle to select 1 Hz (full frequency range, 1 Hz to 100 KHz) or 1/sample time. This field corresponds to the “bandwidth limit” bit in the BTW data file as described in the 1771 Configurable Flowmeter Module User Manual.
End Sample On	In high-resolution frequency mode, press [F9] - Toggle to select time only or time/counts. This field corresponds to the “sampling termination” bit in the BTW data file as described in the 1771 Configurable Flowmeter Module User Manual.
Counts to End Sampling	In high-resolution frequency mode, when you have selected time/counts to end sampling enter a number of counts up to 32,767. In other modes, or when sampling ends on time only, the software sets this field to 0.

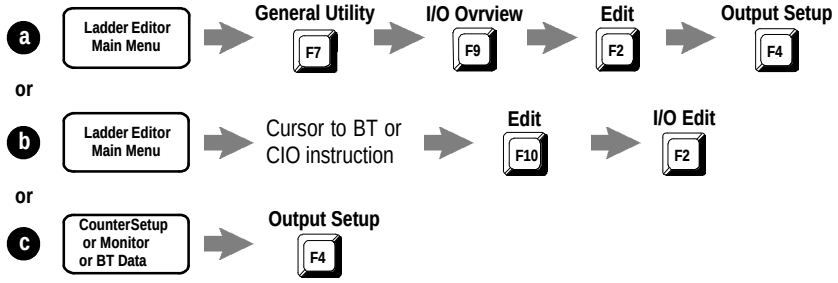
(Continued)

Field:	Valid Values:
Frequency Resolution	In high-resolution frequency mode, select the precision of the frequency returned in the BTR or CIO Read. You can select 1 Hz or 0.1 Hz resolution. (If you have scaling programmed for frequency, the resolution will be in whole numbers of tenths of scaled frequency units.) In other channel modes, frequency is always reported in whole numbers.
Frequency Scalers (Multiply/Divide)	If you want to have the module report frequency in units meaningful to your application, enter a multiplier and divisor here, separated by a (/). Each scaler must be 1 to 255, and the multiplier must be less than or equal to the divisor. For example, if one count represents 7 gallons, you could scale frequency to gallons per minute by entering scalers of 7/60. Scaling affects only the frequency value that the module returns in the BTR or CIO Read. All programming in the BTW or CIO Write e.g., highest allowed frequency, output ON and OFF values is still in Hz. The default is 1/1, meaning no scaling.
Scalers for Total (Multiply/Divide)	In totalizer and nonresettable totalizer modes, you can configure the module to report total counts in units meaningful to your application. To do this, enter a multiplier and a divisor here, separated by a (/). Each scaler must be 1 to 32,767, and the multiplier must be less than or equal to the divisor. The default is 1/1, meaning no scaling. For example, if 15 counts represent 2 gallons, you could scale counts to gallons by entering scalers of 2/15. Scaling affects only the total counts value that the module returns in the BTR or CIO Read. All programming in the BTW or CIO Write e.g, rollover value, output ON and OFF values - is still in unscaled counts.
Rollover Value	Enter a value between 0 and 9,999,999. (The default, 0, is equivalent to 9,999,999.) When the unscaled count reaches that value, the module sets the overflow status bit in the BTR or CIO Read and starts counting again from 0.
Tied to Outputs	Display only. This shows the output(s) that this channel is currently tied to. You can tie outputs to different channels on the Output Setup screen, but you can't change the values on the Channel Setup screen.
Reset Total	Totalizer mode only.
Reset Overflow	Totalizer and nonresettable totalizer mode only.
Start Prover	Totalizer and nonresettable totalizer mode only. These fields display the current settings in the BTW or CIO Write data file. You must make any changes to these fields through a running program on the PLC, or by directly setting the bits in the BTW or CIO Write; you can't edit these fields with the I/O configuration utility.
Prover Type, Uni or Bidirectional	In totalizer and nonresettable totalizer modes, press [F9] Toggle to select the type of prover to use, unidirectional or bidirectional prover.
Gate Debounce	In totalizer and nonresttable totalizer modes, press [F9] Toggle to select off or on. The default is off.

Press **[F4] Output Setup** for other configuration choices or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See “Accepting Edits” in chapter 1 for more information.

Output Setup Screen 1771-CFM

Choose one:




```
1771 CFM/A                    Output Setup                          R G M: 0 0 0

     output  current  tied to    forced or
     number  status   channel   triggered by      ON when >=    OFF when >=

       0       off       0     rate/frequency         1,000         25,000

       1       off       2     total                      0      3,500,000

       2       on        0     rate/frequency             0         12,000

       3       off       0     acceleration             100              0




Enter numeric trigger value, or press F9 to change direction trigger.
>
Rem RUN                                          mod 1 of 1      Addr#42:CFM4B
Change     I/O    Channel          Monitor BT Data          Default          Accept
 Mode    Ovrview  Setup                  Tables            Config
  F1       F2       F3                 F5      F6             F8              F10
```

Field:	Valid Values:
Output Number	Displays the output numbers (0-3).
Current Status	Displays each output's current status: o n or o f f. These values reflect the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Tied to Channel	Press [F9] Toggle to display which input channel the output channel is tied to. The default is None.
Forced or Triggered by	Press [F9] Toggle to select one of these characteristics: • Disabled always forces the output to an OFF state. If you select this mode, you cannot tie this output to a channel, and the software won't let you enter ON and OFF values. • Rate/Frequency If you select this mode, you must tie the output to a channel. Specify ON and OFF values in Hz, not in scaled frequency units. • % of Full Scale If you specify this mode, you must tie the output to a channel, and that channel's mode must be totalizer, nonresettable totalizer, or high-resolution frequency. Specify ON and OFF values as percentages of the channel's highest allowable frequency from the Channel Setup screen. • Acceleration If you specify this mode, you must tie the output to a channel, and that channel's acceleration alarm must be nonzero. Specify ON and OFF values of 32,768 to 32,767 Hz/s, representing a change per second in unscaled frequency. • Total If you specify this mode, you must tie the output to a channel, and that channel's mode must be totalizer or nonresettable totalizer. Specify ON and OFF values in unscaled counts from 0 to 9,999,999. If the channel has a nonzero rollover value programmed, the ON and OFF values must be less than the rollover. • Direction If you specify this mode, you must tie the output to a channel, and that channel's mode must be direction sensor. For ON and OFF values, press [F9] Toggle to select stop, CW (clockwise), or CCW (counterclockwise). • Overflow If you specify this mode, you must tie the output to a channel, and that channel's mode must be totalizer or nonresettable totalizer. You cannot enter ON and OFF values. The output will be ON when the overflow bit is set in the BTR or CIO Read, and OFF when the overflow bit is clear. • Prover Running If you specify this mode, you must tie the output to a channel, and that channel's mode must be totalizer or nonresettable totalizer. You cannot enter ON and OFF values. The output will be ON during a prover run and OFF at other times.

(Continued)

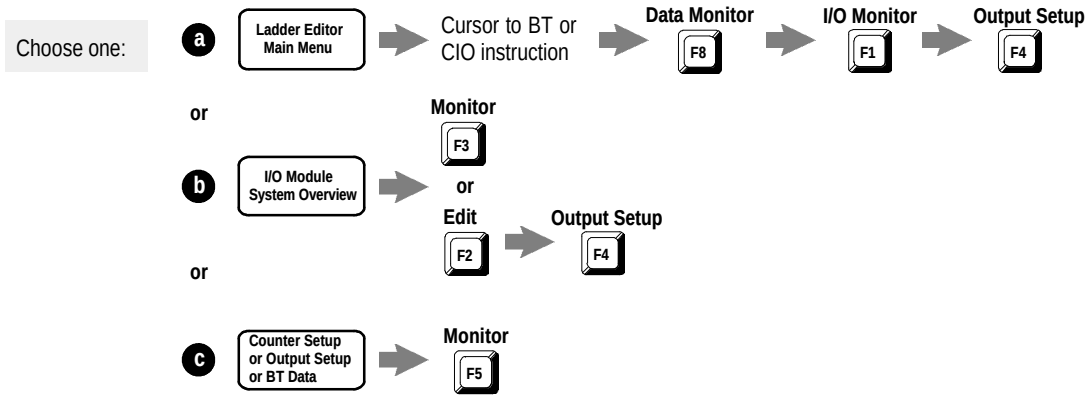
Field:	Valid Values:
Forced or Triggered by (continued)	Press [F9] Toggle to select one of these characteristics: • Prover Range If you specify this mode, you must tie the output to a channel, and that channel's mode must be totalizer or nonresettable totalizer. For ON and OFF values, press [F9] Toggle to select possible prover values: prover not selected, prover selected but not running, in fwd (forward) leg, fwd leg done, in rev (reverse) leg, and done. If the channel's prover type on the Channel Setup screen is unidirectional, "fwd leg done" and "in rev leg" are not valid settings for ON and OFF values. • Forced On If you specify this mode, you cannot tie this output to a channel or enter ON and OFF values. The default is Disabled.
ON when >= OFF when >=	Enter a value between 0 and 9,999,999. • The output state transitions from an OFF state to an ON state when the monitored value exceeds the ON count. • The output state transitions from an ON state to an OFF state when the monitored value exceeds OFF. • The ON and OFF values must not be equal to each other. These fields are only available in certain trigger modes; see the Forced or Triggered by field, above, for constraints.

Press **[F3] Channel Setup** to configure individual channels or **[F10] Accept** to accept your edits. We suggest that you complete your edits on all screens before accepting the edits. See "Accepting Edits" in chapter 1 for more information.

Monitoring 1771-CFM Series A

Use the Monitor screen to check and verify the configuration data. The values on this screen reflect the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module. Follow the steps below.

Monitor Screen 1771-CFM




```
1771 CFM/A                    Monitor                          R G M: 0 0 0

ch         frequency            total   acceleration  prover total/  alarms (*)
               % full scale                             stored count
 0       43.0    .07 (   23)                    0
 1
 2     15,498  12.91 ( 4231)   4,349,126        0              0
 3        258  12.92 ( 4233)   2,047,108        0              0          OF
         (*)  AC=acceleration  SP=overspeed  OF=overflow  OR=overrange

ch          mode              direction     prover    | output  current  tied to
                                            status    | number  status   channel
 0  high resolution frequency                         |   0       off       0
 1  (not used)                                        |   1       off       2
 2  totalizer                              done       |   2       on        0
 3  nonresettable totalizer                done       |   3       off       0
Has module received valid BTW since powerup? yes          BTW error code: none

Press a function key.

Rem RUN                                          mod 1 of 1      Addr#42:CFM4B
Change     I/O    Channel Output          BT Data
 Mode    Ovrview  Setup   Setup          Tables
  F1       F2      F3      F4              F6
```

Several conditions can cause a no. See the description of the power-up bit in the 1771 Configurable Flowmeter Module User Manual.

Field:	Displays this Information:
Channel	Displays the channel (0 to 3).
Frequency	Displays the frequency in Hz and % full scale.
Total	Displays scaled total counts, using scaling from the Channel Setup screen, in totalizer and nonresettable totalizer modes.
Acceleration	Displays the acceleration as a change per second in scaled frequency, in totalizer, nonresettable totalizer, high-resolution frequency, and direction sensor modes.
Prover Total/ Stored Count	Displays the stored count or prover run result (totalizer and nonresettable totalizer total).
Alarms	Displays SP=overspeed, AC=acceleration, OF=overflow, OR=overrange.
Mode	Displays the current counter mode.
Direction	Only in direction sensor mode. Displays the direction of rotation (CW or CCW).
Prover Status	Displays prover status for channels in totalizer and nonresettable totalizer modes.
Output Number	Displays the output channel (0 to 3).
Current Status	Displays the output state of the current output (ON or OFF). These values reflect the data received the last time a BTR or CIO Read was completed. The processor must be in Run mode if you want to receive current data from the module.
Tied to Channel	Displays which channel the output is tied to.
Module Power-up	Displays whether a BTW or CIO Write has successfully occurred since power-up.
BTW Error Code	If an error occurred in the last BTW, the error code is shown here. Error codes 1 to 60 are word numbers where invalid configuration was programmed in the BTW data file; other error codes are listed in the 1771-CFM User manual.

5 Configuring 1400-PB and 1400-PD Power Monitor Devices

Chapter Objectives

This chapter explains how to configure 1400-PB and 1400-PD I/O devices using the I/O configuration utility. You should have already read chapter 1 because it explains the basic functions and screens you'll use.

Accepting Edits

The procedure for accepting edits in the configuration of 1400-PB and 1400-PD devices differs from that for other I/O modules. You can accept the edits on **any** of the three Device Setup screens. The edits for **all** of the Device Setup screens are written to the BTW or CIO Write data file. Data from other edit screens **is not** written to the BTW or CIO Write data file.

However, if you accept edits on any of the other three edit screens (Setpoint Setup, Time Setup, or Control Request), only the edits made on that particular screen are written to the BTW or CIO Write data file. Therefore, if you make edits on more than one of these screens, you must accept the edits you have made on each individual screen.

If you press **[Esc]** or **[F2] I/O Ovrview** while you have pending edits on another screen, the software reminds you that you have pending edits and asks you if you want to abandon them. Press **[F10] No** and then **[PageUp]** or **[PageDown]** to find the screens with pending edits.

Configuring 1400-PB and 1400-PD

To configure 1400-PB and -PD Series A devices, follow these steps.

Setup Screens 1400-PB, 1400-PD

When you first access any of the six setup screens, the following message appears:

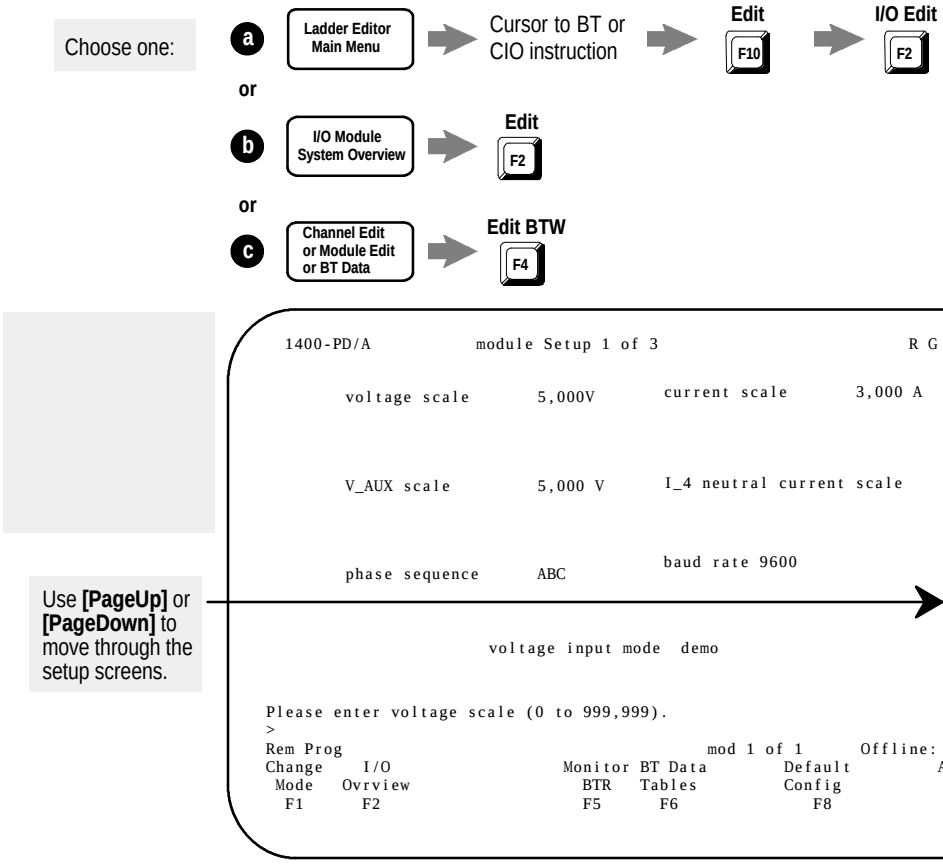
Do you intend to reconfigure the Power Monitor device?

- If you press **[F8] Yes**, the software prompts you to enter the current unit password. Enter the password. You have three tries to enter the correct password. If you do not succeed, you can view all screens, but you cannot edit any setup screens.
- If you press **[F10] No**, you can view all screens, but you cannot edit any setup screens. If you change your mind and want to edit the configuration, press **[F2] I/O Ovrview**, then **[F2] Edit**.

The following table lists page references for each screen.

For Information about this Screen:	See Page:
Device Setup	(Screen 1) 5-3
	(Screen 2) 5-4
	(Screen 3) 5-5
Setpoint Setup	5-6
Time Setup	5-7
Control Request	5-8

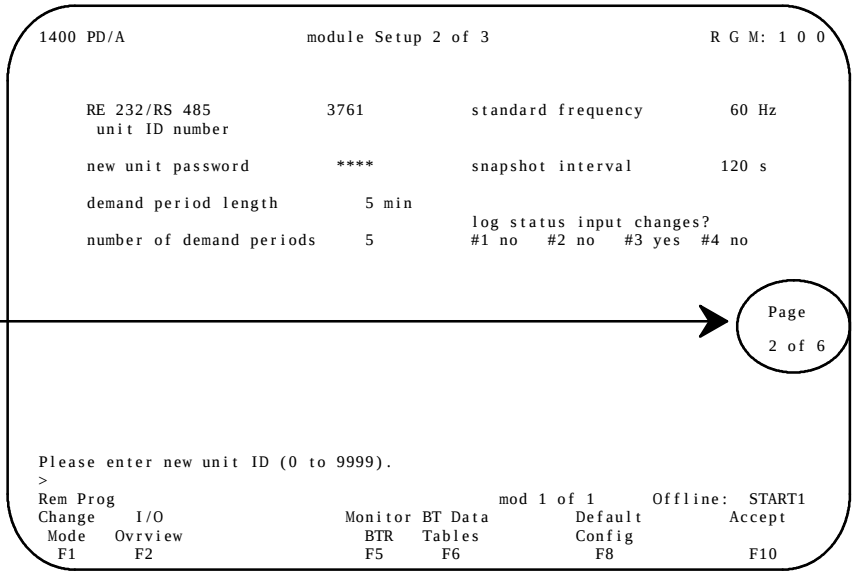
Device Setup (1 of 3)



Field:	Valid Values:
Voltage Scale	Displays the voltage scale. Enter a value between 0 and 999,999 to change the scale. The default is 1,200.
V_AUX Scale	Displays the V_{aux} scale. Enter a value between 0 and 999,999 to change the scale. The default is 1,000.
Phase Sequence	Press [F9] Toggle to move between ABC and ACB. The default is ABC.
Current Scale	Displays the current scale. Enter a value between 0 and 30,000 to change the scale. The default is 5,000.
I_4 Neutral Current Scale	Displays the I_4 neutral current scale. Enter a value between 0 and 9,999 to change the scale. The default is 5,000.
Baud Rate	Press [F9] Toggle to move among 300, 1200, 2400, 4800, 9600, and 19200. Default is 9600.
Voltage Input Mode	Press [F9] Toggle to move among Delta, Single Phase, Demo, 3-Wire Wye, and 4-Wire Wye. Default is 4-Wire Wye.

Device Setup (2 of 3)

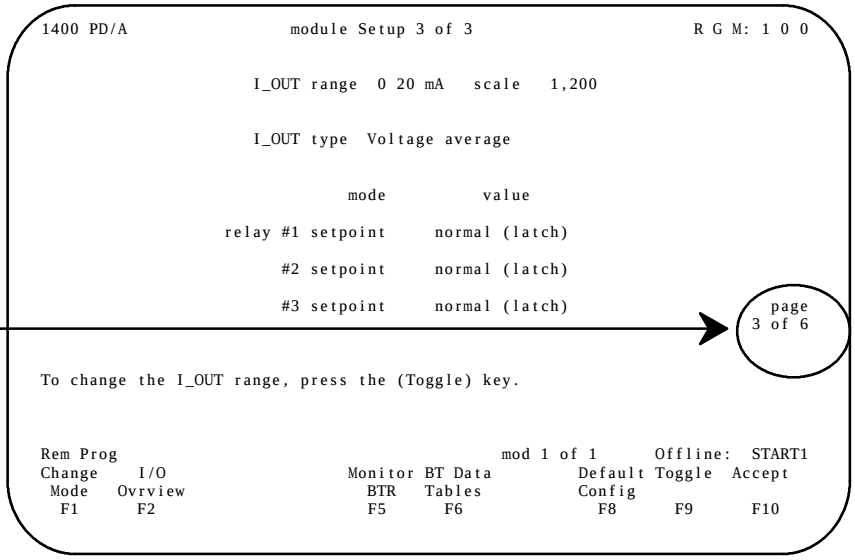
If you are using CIO instructions, the rack-group-module address in the upper right corner is replaced with a node-slot address (for example, 001-00).



Field:	Valid Values:
RS-232/RS-485 Unit ID Number	Displays the unit ID number. Enter a value between 0 and 9999 to change the ID. The default is set in the device. You can change this setting, but do not use 0.
New Unit Password	Change the unit password by entering a new 4-digit value here. The default is 0. Enter the password a second time to confirm it. The password is visible on your screen until you press [Enter].
Demand Period Length	Select external sync mode or enter the length of each demand period (0-99 minutes) to use in calculating demand values. The default is 2 minutes.
Number of Demand Periods	Enter the number of demand (1-15) periods to be averaged. The default is 2.
Standard Frequency	Press [F9] Toggle to select the frequency (50, 60, 400 Hz) for the module to monitor. The default is 60 Hz.
Snapshot Interval	Enter the duration of the Snapshot Interval (0-999,999,999). The default is 60 seconds.
Log Status Input Changes	Press [F9] Toggle to select which, if any, status inputs you want to log. The default is No.

Device Setup (3 of 3)

Use **[PageUp]** or **[PageDown]** to move through the setup screens.

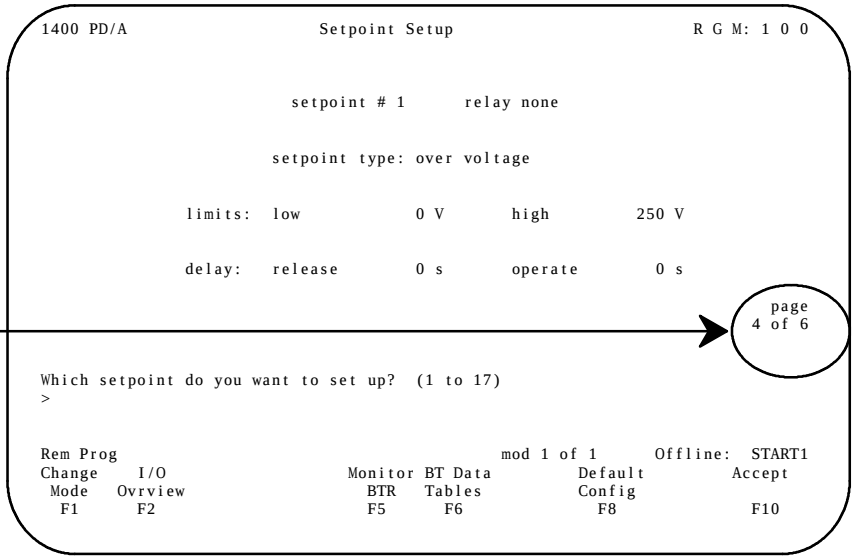

1400 PD/A module Setup 3 of 3 R G M: 1 0 0
I_OUT range 0 20 mA scale 1,200
I_OUT type Voltage average
mode value
relay #1 setpoint normal (latch)
#2 setpoint normal (latch)
#3 setpoint normal (latch)
page 3 of 6
To change the I_OUT range, press the (Toggle) key.
Rem Prog mod 1 of 1 Offline: START1
Change Mode F1
I/O Ovrview F2
Monitor BT Data BTR F5
Tables F6
Default Config F8
Toggle F9
Accept F10

Field:	Valid Values:
I_OUT Range	Press [F9] Toggle to move between 0-20 mA or 4-20 mA proportional current output. The default is 4-20 mA.
I_OUT Scale	Enter the scale of current output (0-999,999). The default is 200.
I_OUT Type	Press [F9] Toggle to move among the various I_OUT types. Types are: voltage phase L1[1] / KVA phase L1 / KVA total voltage phase L2[2] / KVA phase L2 / KVAR total voltage phase L3[3] / KVA phase L3 / power factor current phase L1 / KVAR phase L1 / KW demand current phase L2 / KVAR phase L2 / AMP demand current phase L3 / KVAR phase L3 / frequency KW phase L1 / voltage average / V_{aux} KW phase L2 / current average / I_4 neutral current KW phase L3 / KW total / I_out external The default is voltage phase L1.
Mode	Press [F9] Toggle to move among Setpoint, KWH Pulse, KVARH Pulse, and KVAH pulse. The default is Setpoint.
Value	Available for setpoint or pulse modes. In setpoint mode, enter a relay value of 0 (latch) to 65,535 in seconds. In any pulse mode, enter the pulse duration, 0 (disabled) to 65,535 hours/pulse.

[1] Voltage from L1-L2 if voltage input mode is delta.
[2] Voltage from L3-L1 if voltage input mode is delta.
[3] Voltage from L2-L3 if voltage input mode is delta.

Setpoint Setup

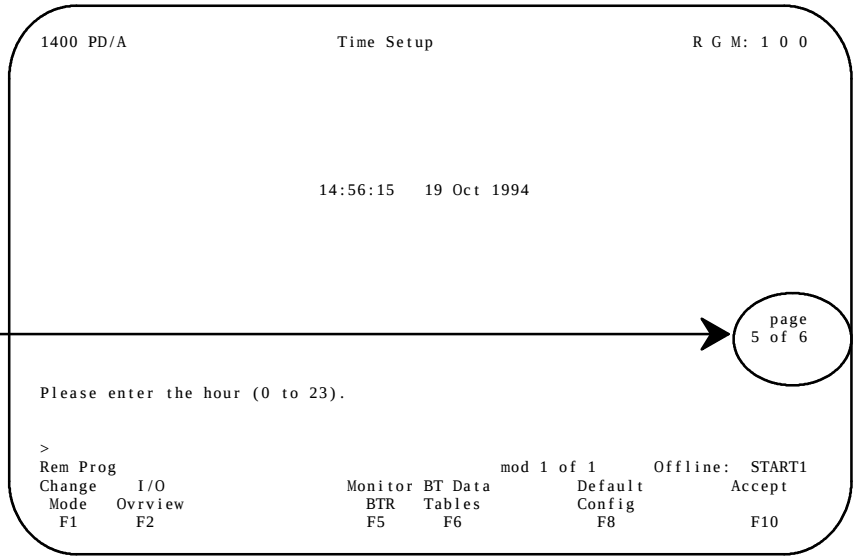
Use **[PageUp]** or **[PageDown]** to move through the setup screens.



Field:	Valid Values:
Setpoint	Enter the setpoint you want to program (1-17).
Relay	Press [F9] Toggle to select relay #1, #2, #3, or none. The default is None.
Setpoint Type	Press [F9] Toggle to choose among various setpoint types. Possibilities are: not used, over voltage, under voltage, voltage unbalance, over current, current unbalance, over KVA, over KW forward, over KW reverse, over KVAR forward, over KW demand, over AMP demand, over frequency, under frequency, over V_AUX, under V_AUX, phase reversal, under PF lagging, under PF leading, over I_4, over KVAR reverse, S1 input normal, S1 input active, S2 input normal, S2 input active, S3 input normal, S3 input active, S4 input normal, S4 input active, SX input normal, SX input active The default is Not Used.
Limits (Low/High)	Enter a low and a high limit value between 0 and 999,999. For frequency setpoints, enter limits between 0 and 99,999.9. If the setpoint type is phase reversal, the limits fields do not appear. The default is 0.
Delay Release	Enter the time to delay between releases (0-32,000). The default is 0.
Delay Operate	Enter the time to delay operation (0-32,000 seconds) of the setpoint.

Time Setup

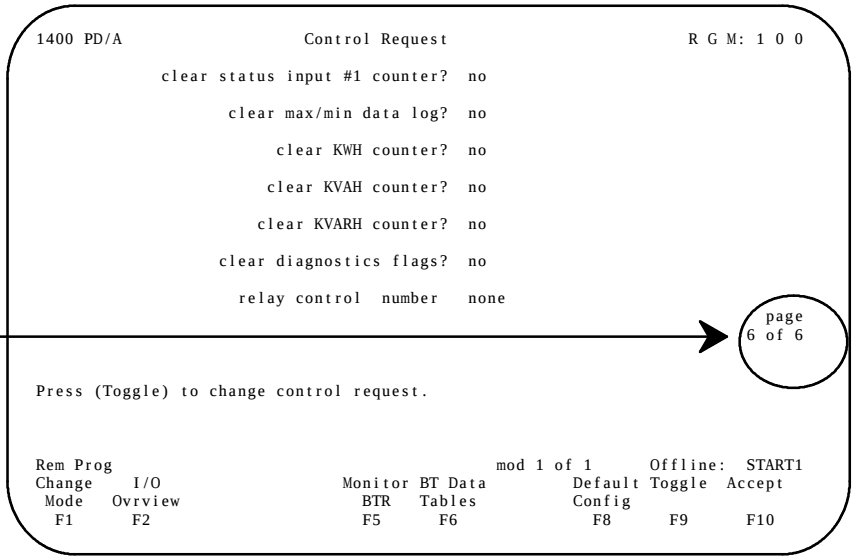
Use **[PageUp]** or **[PageDown]** to move through the setup screens.



Field:	Valid Values:
Time	Enter the time in hours, minutes, and seconds (24 hour clock).
Date	To specify the day, enter a value between 1 and 31. To specify the month, press [F9] Toggle to cycle through the 12 months. To specify the year, enter a value between 0 and 2050.

Control Request

Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1400 PD/A Control Request R G M: 1 0 0
clear status input #1 counter? no
clear max/min data log? no
clear KWH counter? no
clear KVAH counter? no
clear KVARH counter? no
clear diagnostics flags? no
relay control number none
page 6 of 6
Press (Toggle) to change control request.
Rem Prog Change Mode F1
I/O Ovrview F2
mod 1 of 1
Monitor BT Data BTR F5
Tables F6
Offline: START1
Default Config F8
Toggle F9
Accept F10

Field:	Valid Values:
Clear Status Input #1 Counter	Press [F9] Toggle to choose between Yes and No. The default is No.
Clear Max/Min Datalog	
Clear KWH Counter	
Clear KVAH Counter	
Clear KVARH Counter	
Clear Diagnostics Flags	
Relay Control-Number	Press [F9] Toggle to select relay #1, #2, #3, or None. The default is None.
Relay Control-Command	If relay selected for control. Press [F9] Toggle to select a relay command: relay control by 1400, forced operated, or forced released.

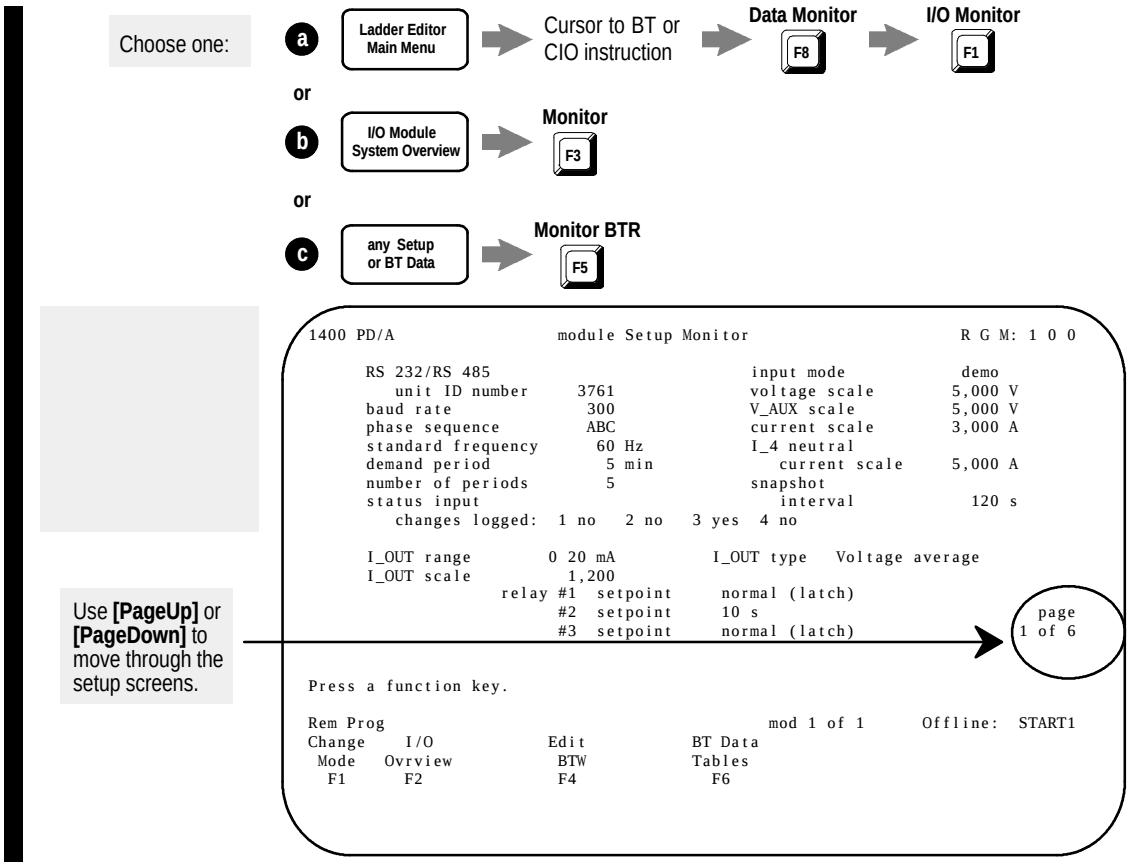
Monitoring 1400-PB and 1400-PD

Use the monitor screen to check and verify the configuration data. The processor must be in Run mode if you want to receive current status from the device.

The monitor screen is divided into six screens. The following table lists page references for each screen.

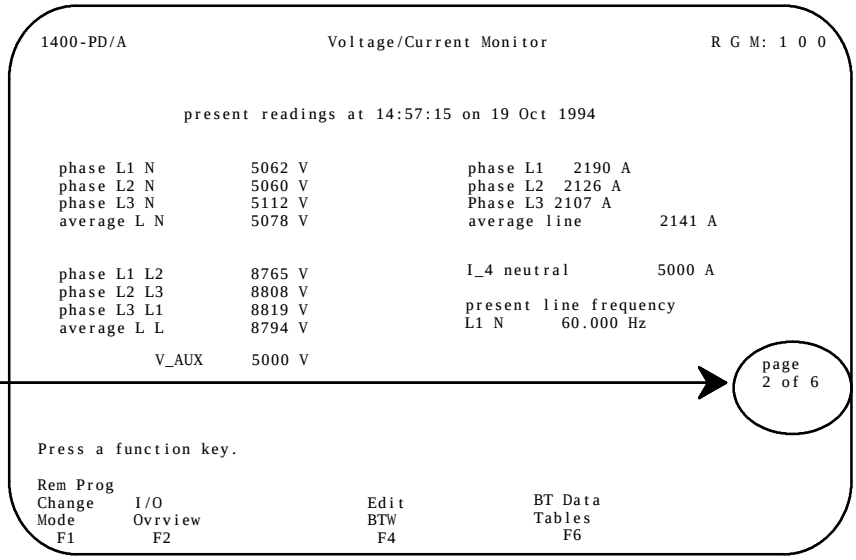
For Information about this Screen:	See Page:
Device Setup Monitor	5-10
Voltage/Current Monitor	5-11
Power Monitor	5-11
Device Status	5-12
Device Diagnostics 1 of 2	5-12
Device Diagnostics 2 of 2	5-13

Device Setup Monitor



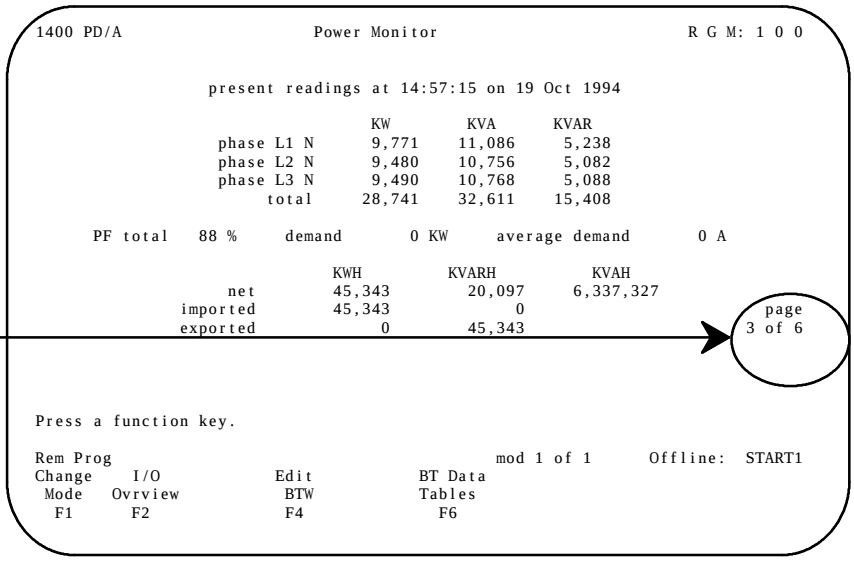
Voltage/Current Monitor

Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1400-PD/A Voltage/Current Monitor R G M: 1 0 0
present readings at 14:57:15 on 19 Oct 1994
phase L1 N 5062 V
phase L2 N 5060 V
phase L3 N 5112 V
average L N 5078 V
phase L1 2190 A
phase L2 2126 A
Phase L3 2107 A
average line 2141 A
phase L1 L2 8765 V
phase L2 L3 8808 V
phase L3 L1 8819 V
average L L 8794 V
V_AUX 5000 V
I_4 neutral 5000 A
present line frequency
L1 N 60.000 Hz
page 2 of 6
Press a function key.
Rem Prog Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

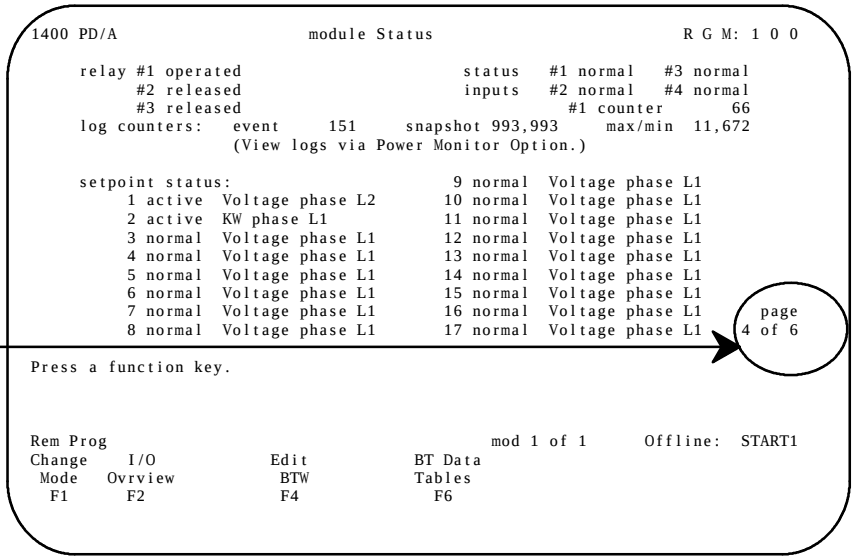
Power Monitor

Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1400 PD/A Power Monitor R G M: 1 0 0
present readings at 14:57:15 on 19 Oct 1994
KW KVA KVAR
phase L1 N 9,771 11,086 5,238
phase L2 N 9,480 10,756 5,082
phase L3 N 9,490 10,768 5,088
total 28,741 32,611 15,408
PF total 88 % demand 0 KW average demand 0 A
KWH KVARH KVAH
net 45,343 20,097 6,337,327
imported 45,343 0
exported 0 45,343
page 3 of 6
Press a function key.
mod 1 of 1 Offline: START1
Rem Prog Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

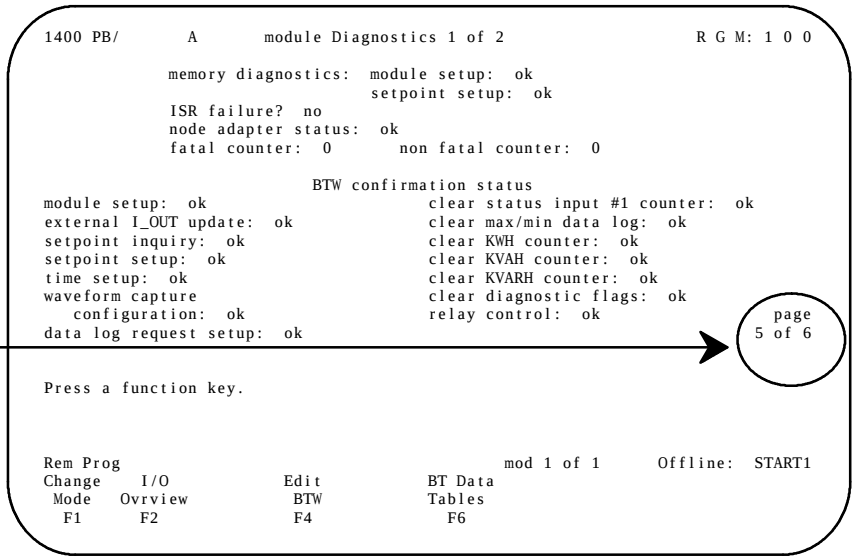
Device Status

Use **[PageUp]** or **[PageDown]** to move through the setup screens.

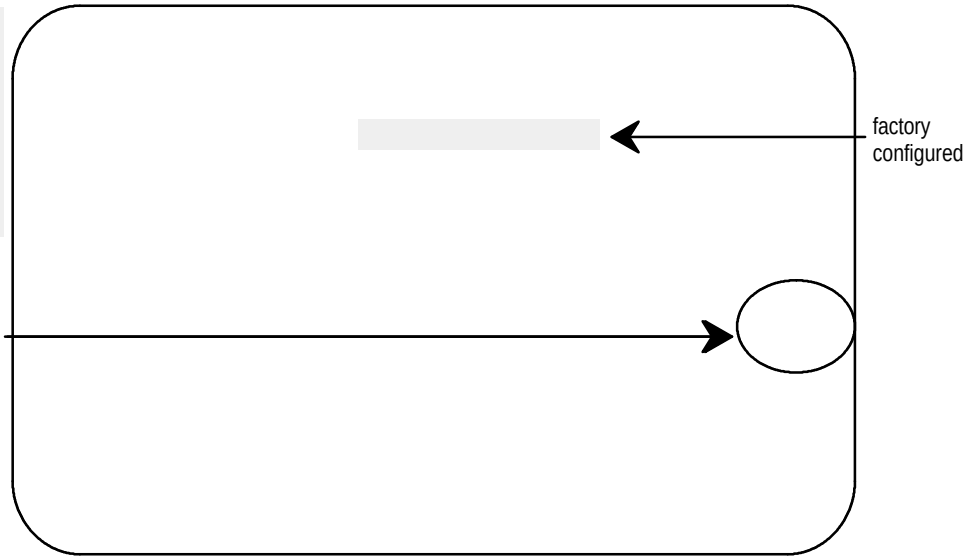

1400 PD/A module Status R G M: 1 0 0
relay #1 operated status #1 normal #3 normal
#2 released inputs #2 normal #4 normal
#3 released #1 counter 66
log counters: event 151 snapshot 993,993 max/min 11,672
(View logs via Power Monitor Option.)
setpoint status:
1 active Voltage phase L2
2 active KW phase L1
3 normal Voltage phase L1
4 normal Voltage phase L1
5 normal Voltage phase L1
6 normal Voltage phase L1
7 normal Voltage phase L1
8 normal Voltage phase L1
9 normal Voltage phase L1
10 normal Voltage phase L1
11 normal Voltage phase L1
12 normal Voltage phase L1
13 normal Voltage phase L1
14 normal Voltage phase L1
15 normal Voltage phase L1
16 normal Voltage phase L1
17 normal Voltage phase L1
page 4 of 6
Press a function key.
Rem Prog mod 1 of 1 Offline: START1
Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

Device Diagnostics 1 of 2

Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1400 PB/ A module Diagnostics 1 of 2 R G M: 1 0 0
memory diagnostics: module setup: ok
setpoint setup: ok
ISR failure? no
node adapter status: ok
fatal counter: 0 non fatal counter: 0
BTW confirmation status
module setup: ok
external I_OUT update: ok
setpoint inquiry: ok
setpoint setup: ok
time setup: ok
waveform capture configuration: ok
data log request setup: ok
clear status input #1 counter: ok
clear max/min data log: ok
clear KWH counter: ok
clear KVAH counter: ok
clear KVARH counter: ok
clear diagnostic flags: ok
relay control: ok
page 5 of 6
Press a function key.
Rem Prog mod 1 of 1 Offline: START1
Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

Device Diagnostics 2 of 2



Use **[PageUp]** or **[PageDown]** to move through the setup screens.

6 Configuring 1402-LS51 Series A Line Synchronization Modules

Chapter Objectives

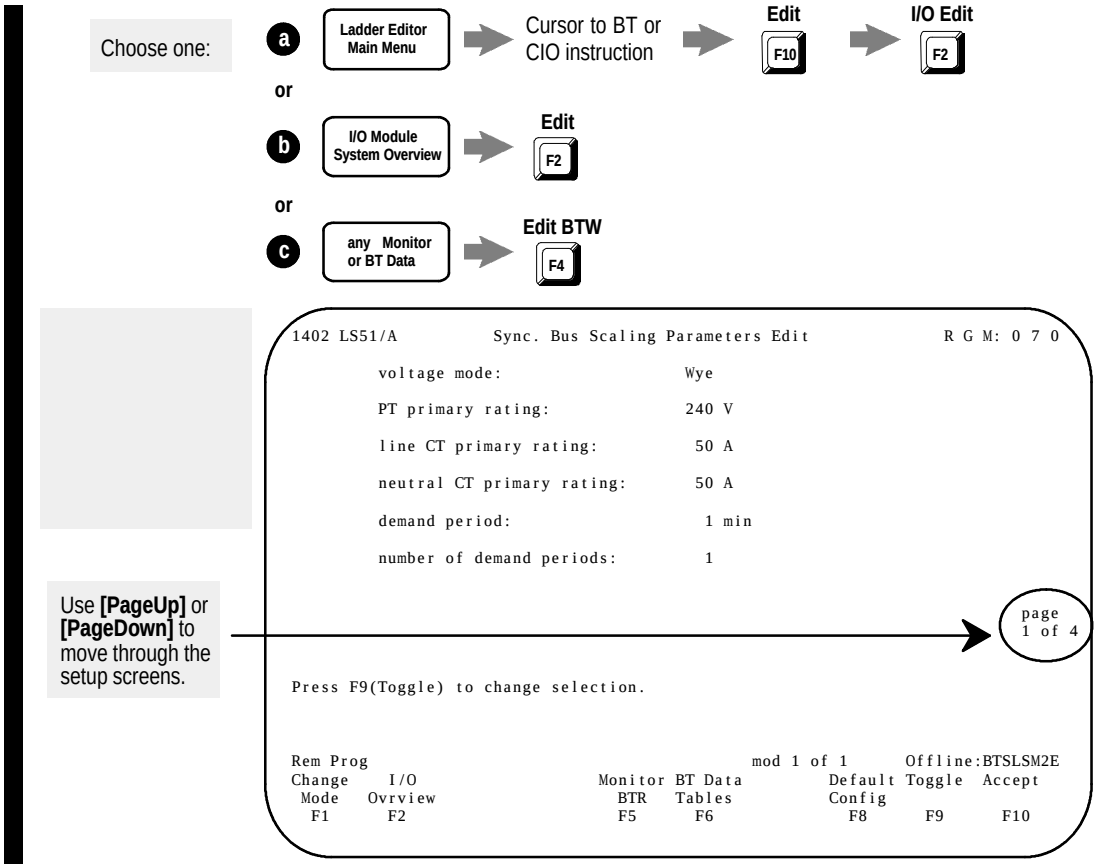
This chapter explains how to configure a 1402-LS51 series A Line Synchronization module. You should have already read chapter 1 because it explains the basic functions and screens you'll use.

Configuring 1402-LS51 Series A

To configure a 1402-LS51 series A module, enter the appropriate information on the following screens. The following table lists page references for each screen. Follow the steps on the next page.

For Information about this Screen:	See Page:
Scaling Parameters Edit	6-2
Synchronization Parameters Edit	6-3
Load Share Parameters Edit	6-4
Control Request Parameters	6-5
Synchronization/Load Share Monitor	6-6
Synchronization Bus Voltage/Current Monitor	6-7
Synchronization Bus Power Monitor	6-7
Reference Bus Voltage Monitor	6-8
Scaling Parameters View	6-8
Synchronization Parameters View	6-9
Load Share Parameters View	6-9
Diagnostics	6-10

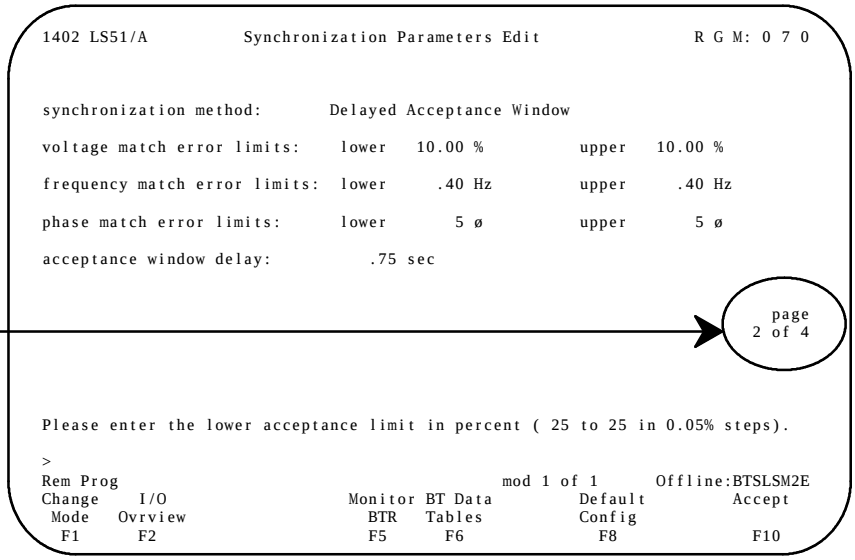
Scaling Parameters Edit Screen



Field:	Valid Values:
Voltage Mode	Press [F9] - Toggle to choose among wye, delta, and open delta. The default is wye.
PT Primary Rating	Enter the potential transformer's primary rating in volts (120-115,000). The default is 120.
Line CT Primary Rating	Enter the line current transformer's primary rating in amps (5-10,000). The default is 5.
Neutral CT Primary Rating	Enter the neutral current transformer's primary rating in amps (5-10,000). The default is 5.
Demand Period	Enter the demand period in minutes (1-99). The default is 1.
Number of Demand Periods	Enter the number of demand periods (1-15). The default is 15.

Synchronization Parameters Edit Screen

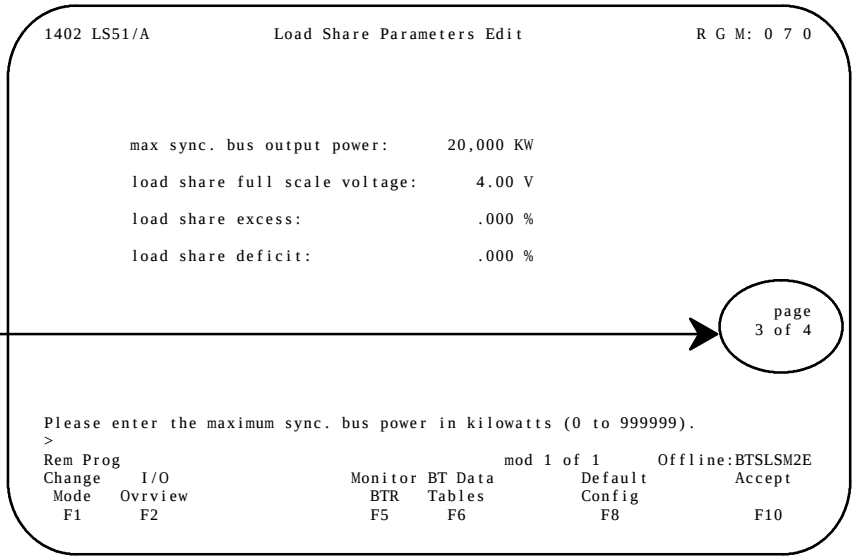
Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1402 LS51/A Synchronization Parameters Edit R G M: 0 7 0
synchronization method: Delayed Acceptance Window
voltage match error limits: lower 10.00 % upper 10.00 %
frequency match error limits: lower .40 Hz upper .40 Hz
phase match error limits: lower 5 ø upper 5 ø
acceptance window delay: .75 sec
page 2 of 4
Please enter the lower acceptance limit in percent (25 to 25 in 0.05% steps).
>
Rem Prog mod 1 of 1 Offline:BTSLSM2E
Change Mode F1
I/O Ovrview F2
Monitor BT Data BTR F5
Tables F6
Default Config F8
Accept F10

Field:	Valid Values:
Synchronization Method	Delayed Acceptance Window. You cannot edit this field.
Voltage Match Error Limits	Enter the upper and lower acceptance limits in percent (25 to 25 in 0.05% steps). The default low limit is 5.00%. The default high limit is 5.00%.
Frequency Match Error Limits	Enter the upper and lower acceptance limits in steps of 0.01 Hertz (1 to 1). The defaults are 0.50 Hz and +0.50 Hz.
Phase Match Error Limits	Enter the upper and lower acceptance limits in steps of 0.01 degrees (20 to 20). The defaults are 10 degrees and +10 degrees.
Acceptance Window Delay	Enter the acceptance window delay in seconds (0-10 in 0.05 second steps). The default is 1.00.

Load Share Parameters Edit Screen

Use **[PageUp]** or **[PageDown]** to move through the setup screens.

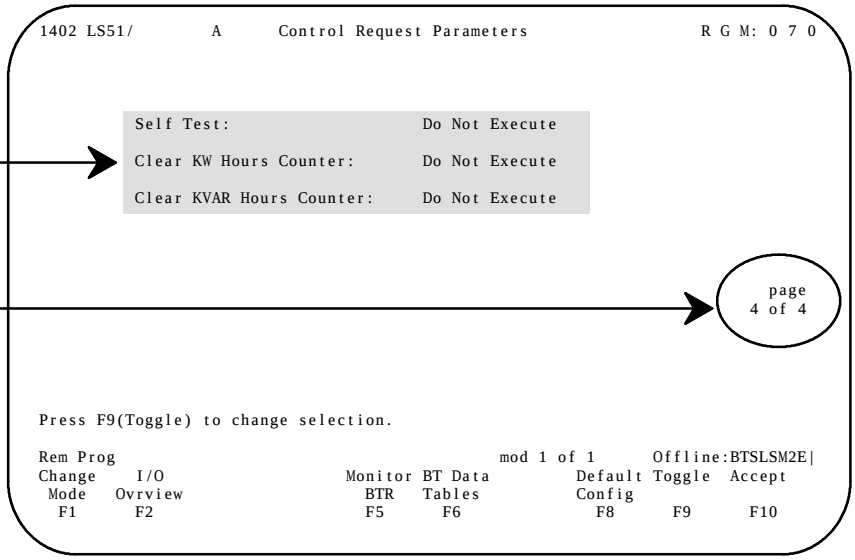

1402 LS51/A Load Share Parameters Edit R G M: 0 7 0
max sync. bus output power: 20,000 KW
load share full scale voltage: 4.00 V
load share excess: .000 %
load share deficit: .000 %
page 3 of 4
Please enter the maximum sync. bus power in kilowatts (0 to 999999).
>
Rem Prog mod 1 of 1 Offline:BTSLSM2E
Change Mode F1
I/O Ovrview F2
Monitor BT Data BTR F5
Tables F6
Default Config F8
Accept F10

Field:	Valid Values:
Max Sync. Bus Output Power	Enter the maximum synchronous bus power in kilowatts (0-999,999). The default is 0.
Load Share Full Scale Voltage	Enter the load share full-scale voltage in steps of 0.01 V (2-4 V). The default is 4.
Load Share Excess	Enter the load share excess (0.500 to 0). The default is 0.500.
Load Share Deficit	Enter the load share deficit (0-0.500). The default is 0.500.

Control Request Parameters Screen

Press **[F9] Toggle** to choose between Do Not Execute and Execute. The default is Do Not Execute.

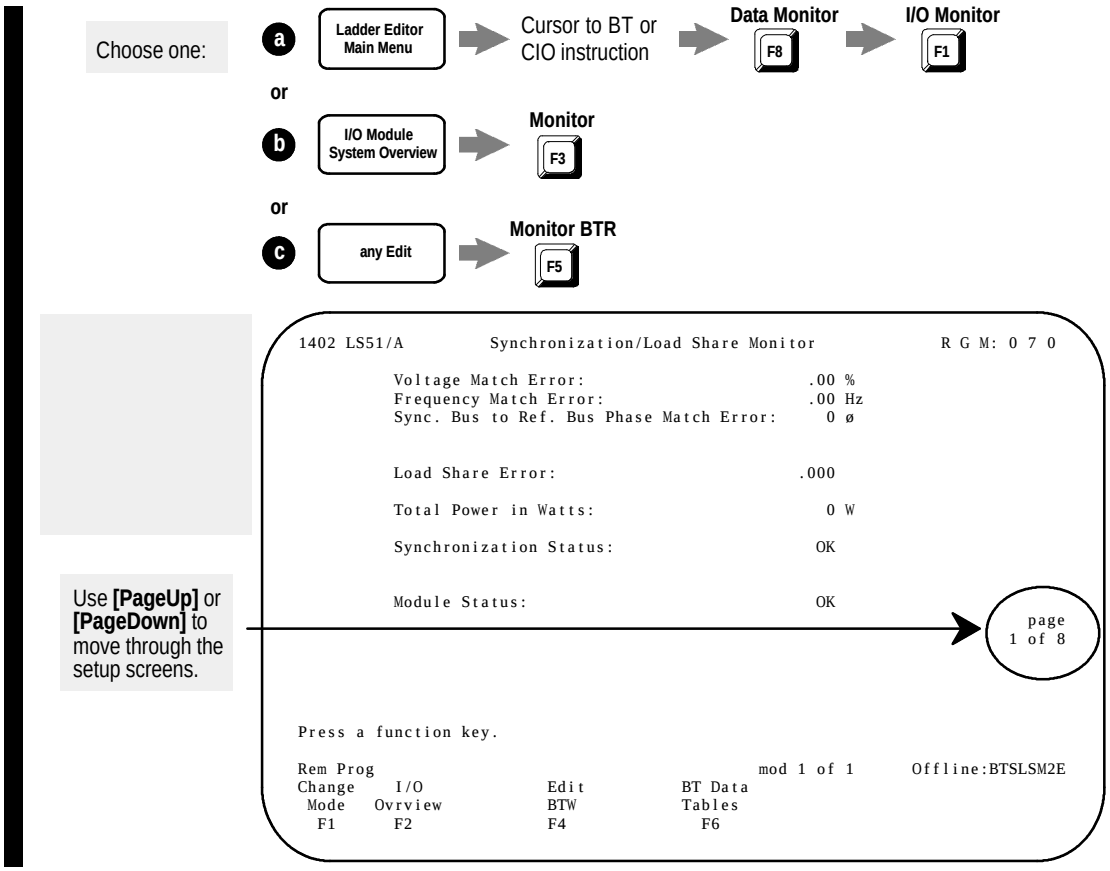
Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1402 LS51/ A Control Request Parameters R G M: 0 7 0
Self Test: Do Not Execute
Clear KW Hours Counter: Do Not Execute
Clear KVAR Hours Counter: Do Not Execute
page 4 of 4
Press F9(Toggle) to change selection.
Rem Prog mod 1 of 1 Offline:BTSLSM2E|
Change Mode F1
I/O Ovrview F2
Monitor BT Data BTR F5
Tables F6
Default Config F8
Toggle F9
Accept F10

Monitoring 1402-LS51 Series A

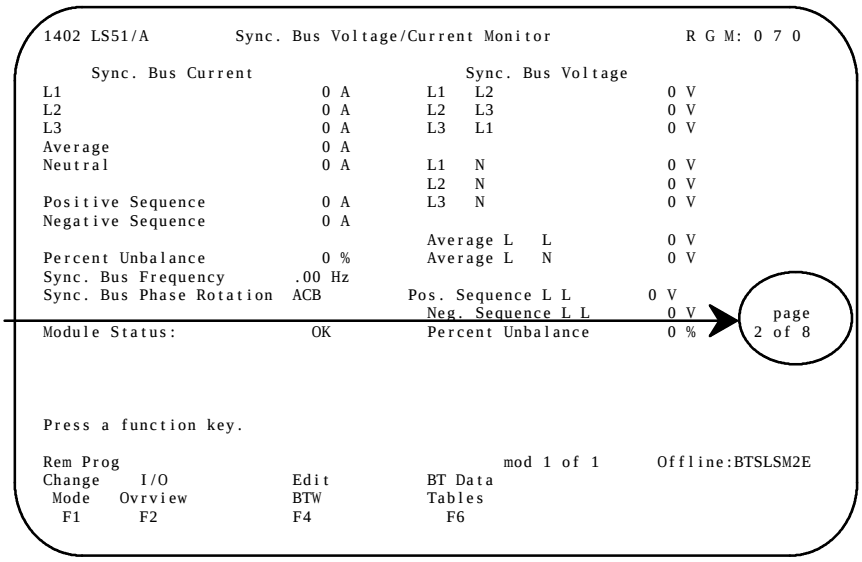
Use the Monitor screen to check and verify the configuration data. The processor must be in Run mode if you want to receive current status from the device.

Synchronization/Load Share Monitor Screen



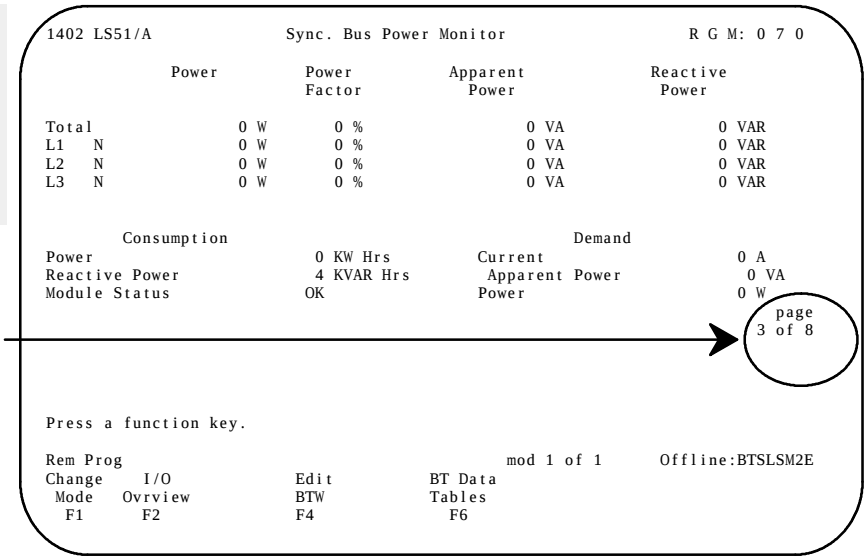
Synchronization Bus Voltage/Current Monitor Screen

Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1402 LS51/A Sync. Bus Voltage/Current Monitor R G M: 0 7 0
Sync. Bus Current
L1 0 A
L2 0 A
L3 0 A
Average 0 A
Neutral 0 A
Positive Sequence 0 A
Negative Sequence 0 A
Percent Unbalance 0 %
Sync. Bus Frequency .00 Hz
Sync. Bus Phase Rotation ACB
Module Status: OK
Sync. Bus Voltage
L1 L2 0 V
L2 L3 0 V
L3 L1 0 V
L1 N 0 V
L2 N 0 V
L3 N 0 V
Average L L 0 V
Average L N 0 V
Pos. Sequence L L 0 V
Neg. Sequence L L 0 V
Percent Unbalance 0 %
page 2 of 8
Press a function key.
Rem Prog
Change Mode F1
I/O Ovrview F2
Edit BTW F4
mod 1 of 1
Offline:BTSLSM2E
BT Data Tables F6

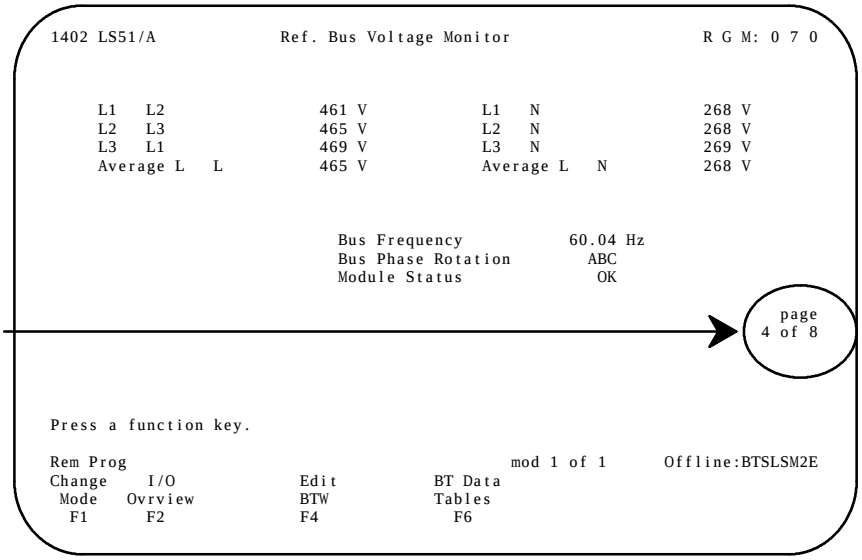
Synchronization Bus Power Monitor Screen

Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1402 LS51/A Sync. Bus Power Monitor R G M: 0 7 0
Power
Power Factor
Apparent Power
Reactive Power
Total 0 W 0 % 0 VA 0 VAR
L1 N 0 W 0 % 0 VA 0 VAR
L2 N 0 W 0 % 0 VA 0 VAR
L3 N 0 W 0 % 0 VA 0 VAR
Consumption
Power 0 KW Hrs
Reactive Power 4 KVAR Hrs
Module Status OK
Demand
Current 0 A
Apparent Power 0 VA
Power 0 W
page 3 of 8
Press a function key.
Rem Prog
Change Mode F1
I/O Ovrview F2
Edit BTW F4
mod 1 of 1
Offline:BTSLSM2E
BT Data Tables F6

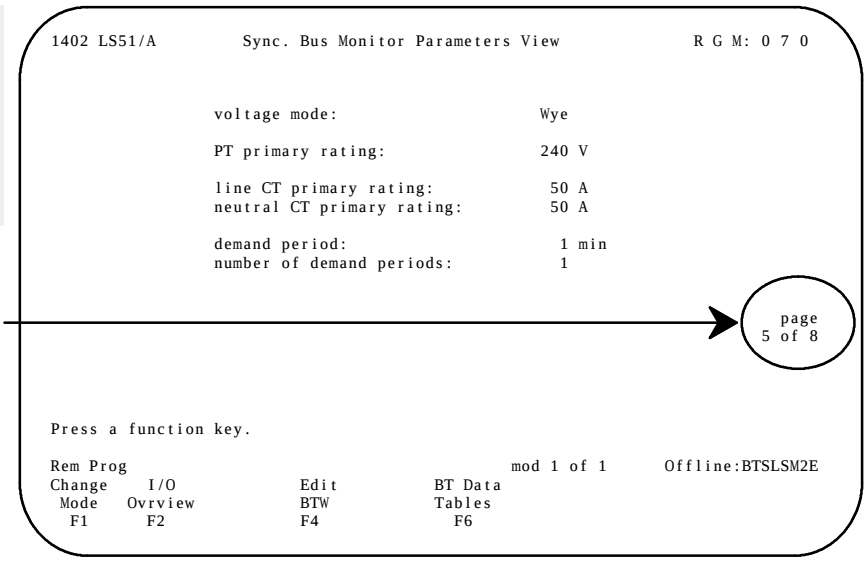
Reference Bus Voltage Monitor Screen

Use **[PageUp]** or **[PageDown]** to move through the setup screens.

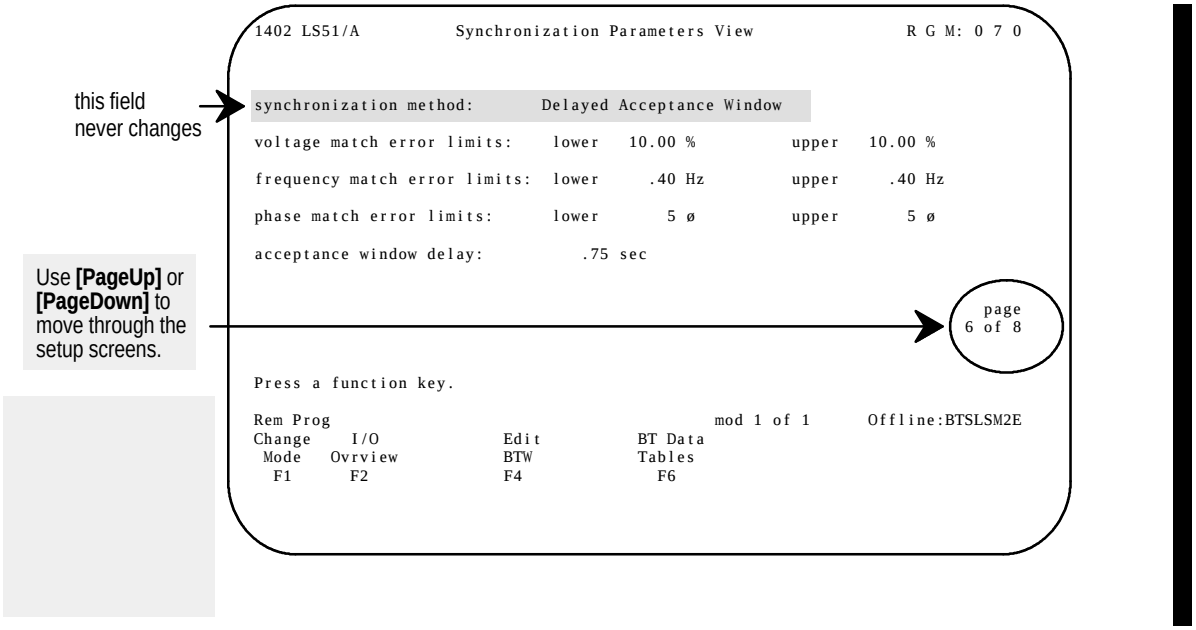

1402 LS51/A Ref. Bus Voltage Monitor R G M: 0 7 0
L1 L2 461 V L1 N 268 V
L2 L3 465 V L2 N 268 V
L3 L1 469 V L3 N 269 V
Average L L 465 V Average L N 268 V
Bus Frequency 60.04 Hz
Bus Phase Rotation ABC
Module Status OK
page 4 of 8
Press a function key.
Rem Prog mod 1 of 1 Offline:BTSLSM2E
Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

Scaling Parameters View Screen

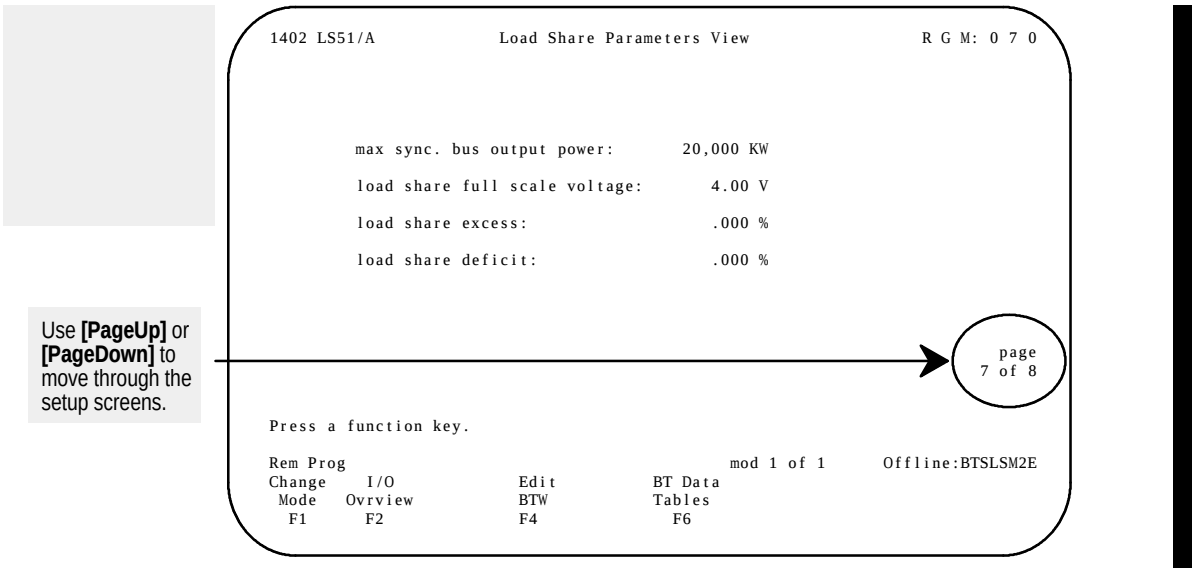
Use **[PageUp]** or **[PageDown]** to move through the setup screens.


1402 LS51/A Sync. Bus Monitor Parameters View R G M: 0 7 0
voltage mode: Wye
PT primary rating: 240 V
line CT primary rating: 50 A
neutral CT primary rating: 50 A
demand period: 1 min
number of demand periods: 1
page 5 of 8
Press a function key.
Rem Prog mod 1 of 1 Offline:BTSLSM2E
Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

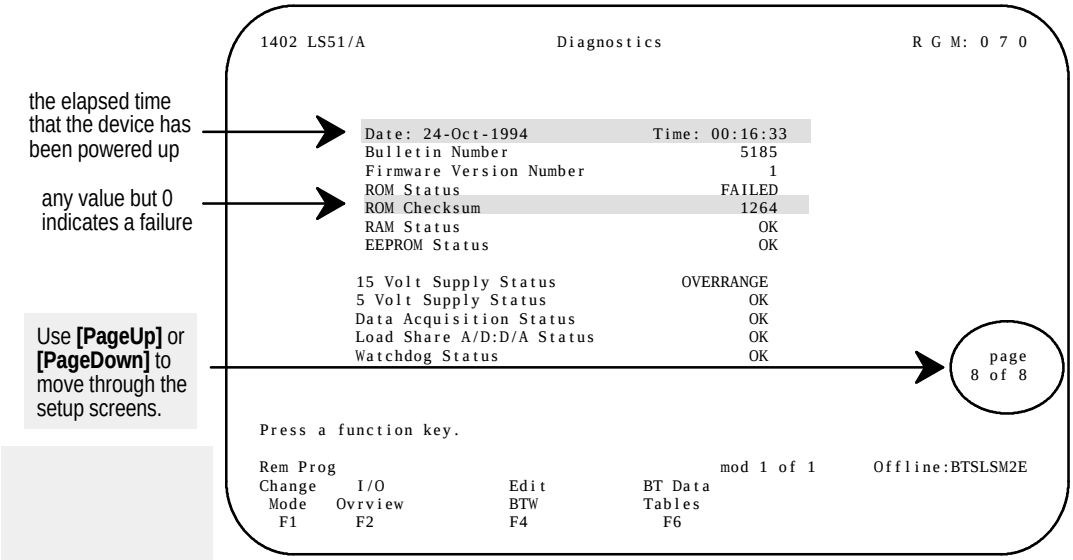
Synchronization Parameters View Screen


this field never changes
Use [PageUp] or [PageDown] to move through the setup screens.
1402 LS51/A Synchronization Parameters View R G M: 0 7 0
synchronization method: Delayed Acceptance Window
voltage match error limits: lower 10.00 % upper 10.00 %
frequency match error limits: lower .40 Hz upper .40 Hz
phase match error limits: lower 5 ø upper 5 ø
acceptance window delay: .75 sec
page 6 of 8
Press a function key.
Rem Prog mod 1 of 1 Offline:BTSLSM2E
Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

Load Share Parameters View Screen


Use [PageUp] or [PageDown] to move through the setup screens.
1402 LS51/A Load Share Parameters View R G M: 0 7 0
max sync. bus output power: 20,000 KW
load share full scale voltage: 4.00 V
load share excess: .000 %
load share deficit: .000 %
page 7 of 8
Press a function key.
Rem Prog mod 1 of 1 Offline:BTSLSM2E
Change Mode F1
I/O Ovrview F2
Edit BTW F4
BT Data Tables F6

Diagnostics Screen



7 Configuring 1791 Analog I/O Blocks

Chapter Objectives

This chapter explains how to configure 1791 analog I/O blocks. You should have already read chapter 1 because it explains the basic functions and screens you'll use.

Configuring 1791 Analog I/O Blocks

To configure a 1791 analog I/O block, follow the steps below.

Module Edit Screen

Choose one:

a. Ladder Editor Main Menu → Cursor to BT or CIO instruction → Edit (F10) → I/O Edit (F2)

or

b. I/O Module System Overview → Edit (F2)

or

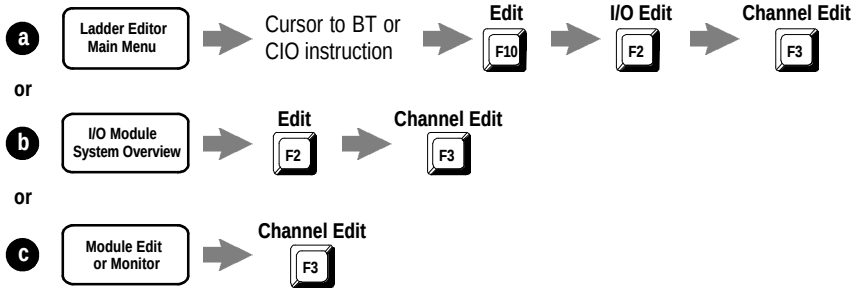
c. Channel Edit or Monitor → Module Edit (F4)

```
1791 N4C2/A                    Module Edit                          R G M: 1 0 0


                  Scaling:                    USER DEFINED

                  Input Channel Range:        + 5V

                  Filter Time:                500 mS




Press F9(Toggle) to change scaling.

Rem RUN                                          mod 2 of 2      Addr#2 :ASMTEST2
Change     I/O    Channel        Monitor BT Data                 Other  Toggle  Accept
 Mode    Ovrview   Edit                 Tables                   Functns
  F1       F2       F3             F5       F6                   F8      F9      F10
```

Field:	Valid Values:
Scaling	Press [F9] Toggle to select default, user-defined, or off. The default is off.
Input Channel Range	Press [F9] Toggle to select + 10 V, ± 10 V, + 5 V, ± 5 V, ± 20 mA, 0-20 mA. The default is ± 10 V.
Filter Time	Press [F9] Toggle to choose between 0 (disabled) and 1.5 seconds in 100 ms steps. The default is disabled.

Channel Edit Screen

Choose one:



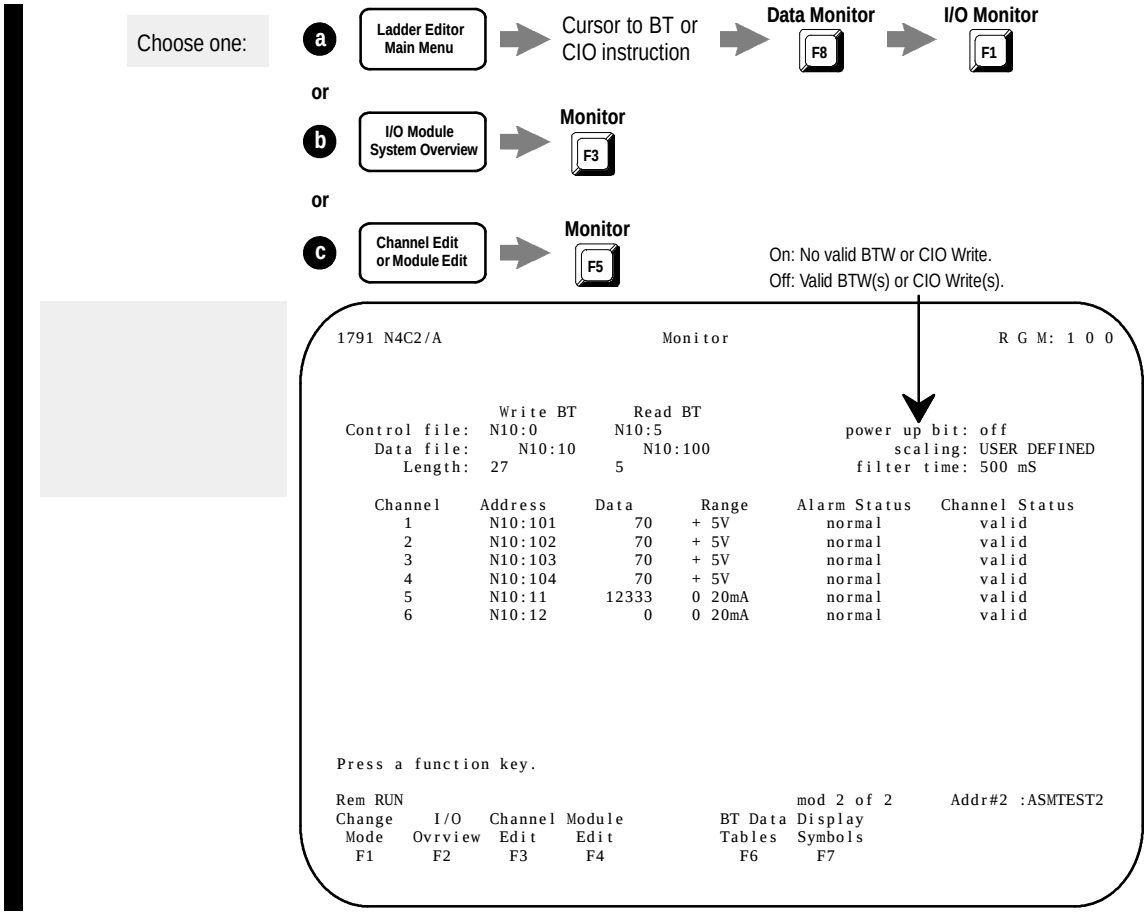

```
1791 N4C2/A                    Channel Edit                          R G M: 1 0 0


                          Scaling:  USER DEFINED


  Ch    Data      Range      Lo Scal   Hi Scal      Alarm  Lo Alm    Hi Alm   DeadBand
   1        70   + 5V              0      5000      ON           0     10000         12
   2        70   + 5V              0      5000      off
   3        70   + 5V              0      5000      off
   4        70   + 5V              0      5000      off
   5     12333   0 20mA            0     20000
   6         0   0 20mA            0     20000
>
Rem RUN                                                 mod 2 of 2      Addr#2 :ASMTEST2
Change     I/O          Module   Monitor BT Data          Other           Accept
 Mode    Ovrview         Edit             Tables          Functns
  F1       F2            F4       F5       F6             F8              F10
```

Field:	Valid Values:
Channel	Displays the index number of a valid channel.
Data	Enter output data values between 32768 and +32767.
Range	Displays a value for the range in volts or mA for channels 1-4. Displays a range value for channels 5 and 6 of the N4C2 module in mA. Displays a range value for channels 5 and 6 of the N4V2 module in volts.
Lo Scal and Hi Scal	Only editable if scaling is user-defined. This field is not displayed when scaling is off. This field is displayed but not editable when you choose default scaling. Enter values for low and high scale; low scale must be less than high scale. Data from the BTR or CIO Read will be scaled between these values.
Alarm	Channels 1-4 only. Press [F9] Toggle to turn lo and hi alarms On or Off .
Lo Alm and Hi Alm	Only displayed when alarm is on. Enter the alarm values. Low alarm must be less than high alarm.
Deadband	Only displayed when alarm is on. Enter the alarm deadband value: < 1/2 (hi alarm lo alarm).

Monitoring 1791 Analog I/O Blocks

Use the monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen



Field:	Displays this Information:
Write BT	Control and data file addresses for the write block transfer or write ControlNet I/O transfer instruction.
Read BT	Control and data file addresses for the read block transfer or read ControlNet I/O transfer instruction.
Power-up Bit	ON or OFF to indicate whether or not the module powered up successfully.
Scaling	Displays DEFAULT, OFF, or USER DEFINED.
Filter Time	Displays the filter time you configured.
Channel	Index number of a valid channel.
Address	Displays the logical address of the value in the Data field.
Data	Displays online data from the module. The data is read from the modules BTR or CIO Read data file.
Range	Displays the current input/output channel voltage/milliamp range.
Alarm Status	Displays the status of the alarm.
Channel Status	Displays the status of the channel.

Calibrating 1791 Analog I/O Blocks

You must be connected to a processor to calibrate an I/O block. To prepare to calibrate a 1791 I/O block, follow the steps on the left.

Calibration/Select Channels Screen

Channel Edit or Module Edit

↓

Other Functions

F8

↓

Calibrate

F7

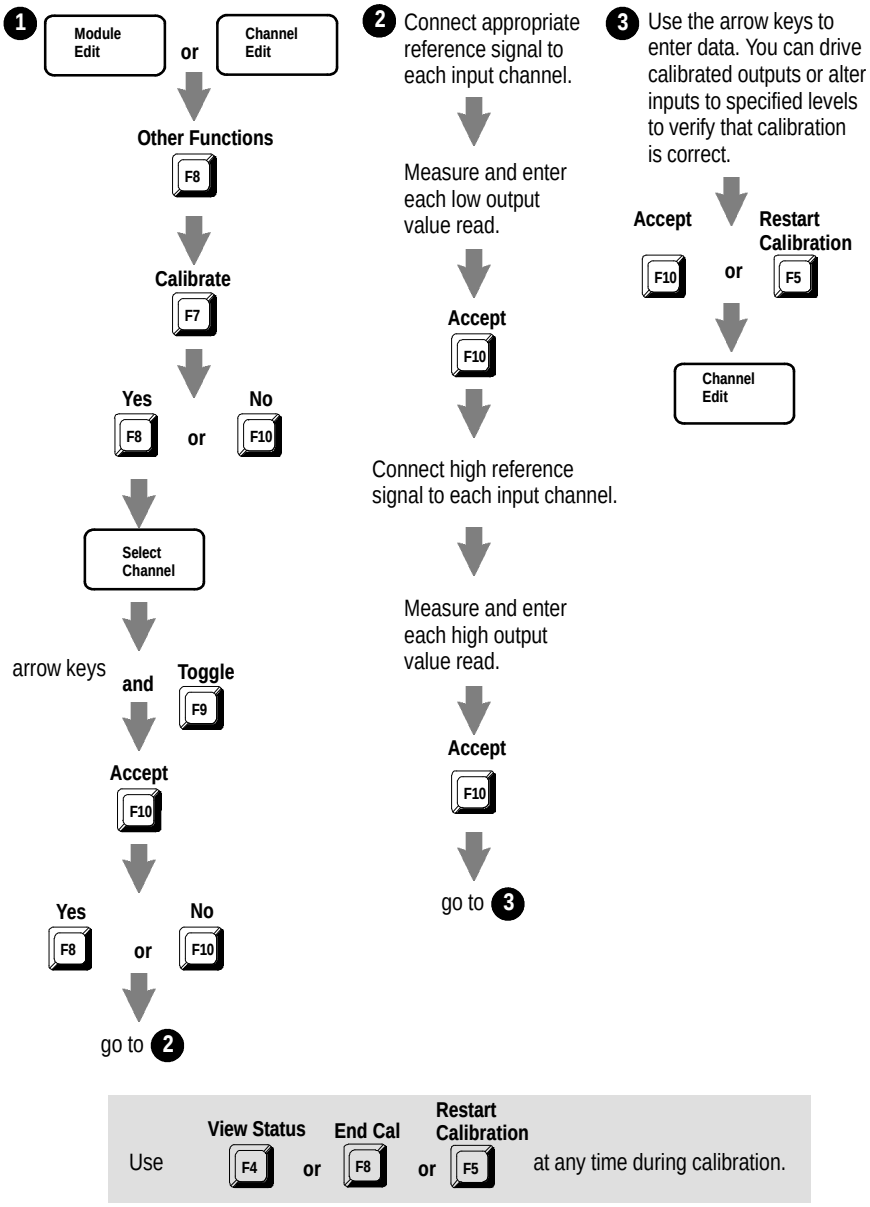
In order to access the calibration function, you must specify the maximum lengths for the BTW (27) and BTR (5) fields on the Block Transfer Control screen.

```
1791 N4C2/A          Calibration / Select Channels              R G M: 1 0 0


                                Calibrate?                          Calibrate?

      1  in   +/  5V            no            5  out  0 20mA           yes
      2  in   +/  5V            no            6  out  0 20mA           no
      3  in   +/  5V            no
      4  in   +/  5V            no

Press F9(Toggle) to select or deselect channel for calibration.




Rem RUN                                        mod 2 of 2      Addr#2 :ASMTEST2
Change     I/O          View                        End     Toggle  Accept
 Mode    Ovrview       Status                     Calibr
  F1       F2            F4                         F8       F9      F10
```

Depending on the types of channels you want to calibrate (input, output, or a combination of input and output), the I/O configuration utility prompts you for the appropriate reference signals. (Figure 7.1 shows the procedure for calibrating a combination of input and output channels.)

Note *Make sure that you apply the correct reference signals and that you measure and record the output signals correctly.*

Figure 7.1
Using the Calibration Screens



Use **View Status** F4 or **End Cal** F8 or **Restart Calibration** F5 at any time during calibration.

8 Configuring 1794 Flex I/O Modules

Chapter Objectives

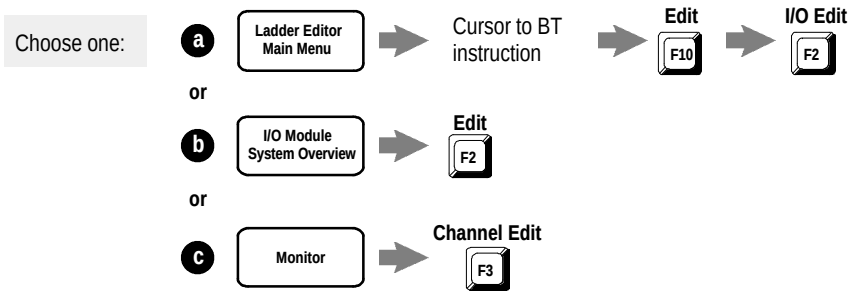
This chapter explains how to configure 1794 Flex I/O modules. You should have already read chapter 1 because it explains the basic functions and screens you'll use.

For Information about Configuring this Module:	See Page:
1794-OE4/A and 1794-OE4/B	8-2
1794-IE4XOE2/A and 1794-IE4XOE2/B	8-6
1794-IE8/A and 1794-IE8/B	8-10
1794-IR8/A	8-13
1794-IT8/A	8-18

Configuring 1794-OE4 Series A and Series B

To configure a 1794-OE4 series A or series B Flex I/O module, follow the steps below.

Channel Edit Screen 1794-OE4



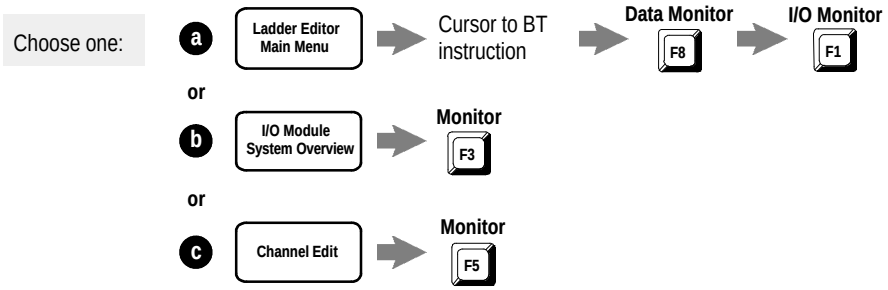

```
1794 OE4/B                    Channel Edit                    R G M: 03 2 1


                                                          Failsafe
    Ch    Address        Range          Data     Signal      Data    Status
     1    N7:2         4 20 mA             0    4.000 mA         0  active

     2    N7:3         4 20 mA             0    4.000 mA         0  active

     3    N7:4         4 20 mA             0    4.000 mA         0  active

     4    N7:5         4 20 mA             0    4.000 mA         0 inactive



Enter a channel number.
>
Rem Prog                                        mod 1 of 1      Offline:HCO_310
Change    I/O                    Monitor BT Data Display                Accept
 Mode   Ovrview                          Tables  Symbols
  F1      F2                      F5      F6      F7                     F10
```

Field:	Valid Values:
Channel	Displays the index number of a valid channel.
Address	Displays the address of the channel data.
Range	Press [F9] Toggle to select the desired range for the channel.
Data	Enter output data values between 32768 and +32767.
Signal	Enter output data according to the selected range. Value must be within the specified range.
Failsafe Data	Value of output when the processor is placed in Program mode, communications are lost, or the user disables the output.
Status	Displays the status of the output (active or inactive).

Monitoring 1794-OE4 Series A and Series B

Use the monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1794-OE4




```
1794 OE4/B                        Monitor                        R G M: 03 2 1


                    Write BT        Read BT
     Control File :  N7:1            N7:1          Ok
        Data File :  N7:2            N7:2
           Length :  14              1

                                                        Failsafe
   Ch    Address          Range       Data    Signal      Data    Status
   1   N7:2             4 20 mA          0   4.000 mA         0  active

   2   N7:3             4 20 mA          0   4.000 mA         0  active

   3   N7:4             4 20 mA          0   4.000 mA         0  active

   4   N7:5             4 20 mA          0   4.000 mA         0 inactive


Press a function key.
>
Rem Prog                                        mod 1 of 1      Offline:HCO_310
Change     I/O   Channel                  BT Data Display
 Mode    Ovrview  Edit                    Tables  Symbols
  F1       F2      F3                       F6      F7
```

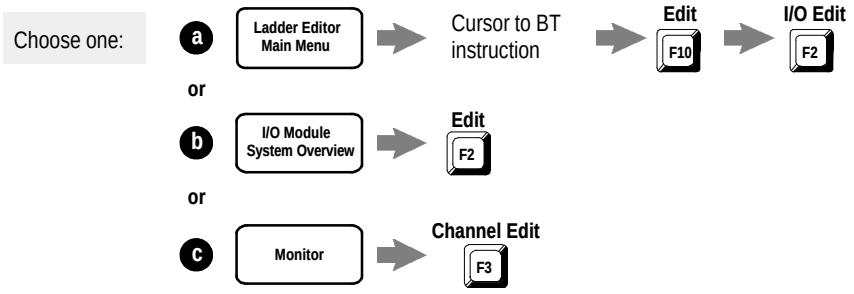
Field:	Valid Values:
Write BT	Displays control and data file addresses for the write block transfer instruction.
Read BT	Displays control and data file addresses for the read block transfer instruction. If the module detects that the toggle bit is set correctly, Ok is displayed to the right of the Read BT field; if the module detects that the toggle bit is set incorrectly, unconfigured is displayed to the right of the Read BT field. [1]
Channel	Displays the index number of a valid channel.
Address	Displays the logical address of the value in the Data field.
Range	Displays the range of the channel.
Data	Displays online data from the module.
Signal	Displays data scaled to a selected range.
Failsafe Data	Displays value of output when the processor is placed in Program mode, communications are lost, or the user disables the output.
Status	Displays the status of the output (active or inactive).

[1] Displayed by 1794 OE4 series B modules only.

Configuring 1794-IE4XOE2 Series A and Series B

To configure a 1794-IE4XOE2 series A or Series B Flex I/O module, follow the steps below.

Channel Edit Screen 1794-IE4XOE2



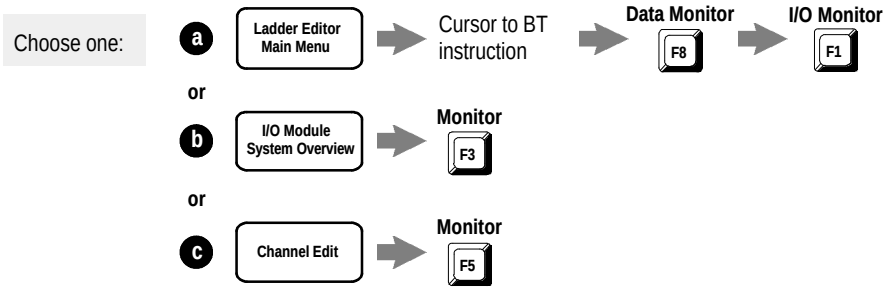

```
1794 IE4XOE2/B                  Channel Edit                    R G M: 03 2 1

   Inputs:  Ch    Address     Range      Data    Signal
             1     N7:2      4 20 mA         0   4.000 mA

             2     N7:3      4 20 mA         0   4.000 mA

             3     N7:4      4 20 mA         7   4.000 mA

             4     N7:5      4 20 mA         2   4.000 mA

                                                    Failsafe
   Outputs: Ch    Address     Range      Data    Signal     Data    Status
             1     N7:2      4 20 mA         0   4.000 mA        0  active

             2     N7:3      4 20 mA         0   4.000 mA        0  active


Enter channel number.
>
Rem Prog                                      mod 1 of 1      Offline:HCO_310
Change     I/O                    Monitor BT Data Display                Review
 Mode    Ovrview                          Tables  Symbols               Errors
  F1       F2                       F5      F6      F7                    F10
```

Field:	Valid Values:
Channel	Input and Output Channels: Displays the index number of a valid channel.
Address	Input and Output Channels: Displays the address of the channel data.
Range	Input and Output Channels: Press [F9] Toggle to select the desired range for the channel.
Data	Input Channels: Displays the data value reported by the module. Output Channels: Enter output data values between 32768 and +32767.
Signal	Input Channels: Displays the data scaled to the selected range. Output Channels: Enter output data according to the selected range. Value must be within the specified range.
Outputs	Output Channels Only: Lets you disable an output, which causes the module to output the backup data value. **Note:** This field is ignored when the processor is placed in Program mode or communications are lost.
Failsafe Data	Output Channels Only: Value of output when the processor is placed in Program mode, communications are lost or you disable the output.
Status	Displays the status of the output (active or inactive).

Monitoring 1794-IE4XOE2 Series A and Series B

Use the monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1794-IE4XOE2




```
1794 IE4XOE2/B                    Monitor                        R G M: 03 2 1

                        Write BT          Read BT
          Control File :  N7:1              N7:1     Ok
             Data File :  N7:2              N7:2
                Length :  10                5

 Inputs: Ch    Address    Range     Data     Signal
           1     N7:2     4 20 mA      0    4.000 mA
           2     N7:3     4 20 mA      0    4.000 mA
           3     N7:4     4 20 mA      0    4.000 mA
           4     N7:5     4 20 mA      0    4.000 mA
                                                    Failsafe
Outputs: Ch    Address     Range     Data    Signal        Data     Status
           1     N7:2     4 20 mA      0    4.000 mA            0  active
           2     N7:3     4 20 mA      0    4.000 mA            0  active



Press a function key.
>
Rem Prog                                        mod 1 of 1      Offline:HCO_310
Change     I/O    Channel                  BT Data Display
 Mode    Ovrview  Edit                     Tables  Symbols
  F1       F2      F3                        F6      F7
```

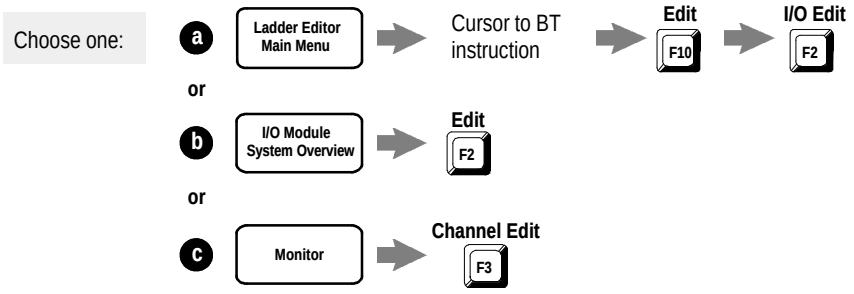
Field:	Displays this Information:
Write BT	Control and data file addresses for the write block transfer instruction.
Read BT	Control and data file addresses for the read block transfer instruction. If the module detects that the toggle bit is set correctly, Ok is displayed to the right of the Read BT field; if the module detects that the toggle bit is set incorrectly, unconfigured is displayed to the right of the Read BT field. [1]
Channel	Input and Output Channels: Displays the index number of a valid channel.
Address	Input and Output Channels: Displays the logical address of the value in the Data field.
Range	Input and Output Channels: Displays the selected range for the channel.
Data	Input and Output Channels: Displays the data value reported by the module.
Signal	Input and Output Channels: Displays the data scaled to the selected range. If the module detects that the circuit to the channel is open, wire-off is displayed to the right of the Signal field.
Outputs	Output Channels Only: Displays whether or not output is disabled. **Note:** This field is ignored when the processor is placed in Program mode or communications are lost.
Failsafe Data	Output Channels Only: Value of output when the processor is placed in Program mode, communications are lost or you disable the output.
Status	Displays the status of the output (active or inactive).

[1] Displayed by 1794 IE4XOE2 series B modules only.

Configuring 1794-IE8 Series A and Series B

To configure a 1794-IE8 series A or series B Flex I/O module, follow the steps below.

Channel Edit Screen 1794-IE8



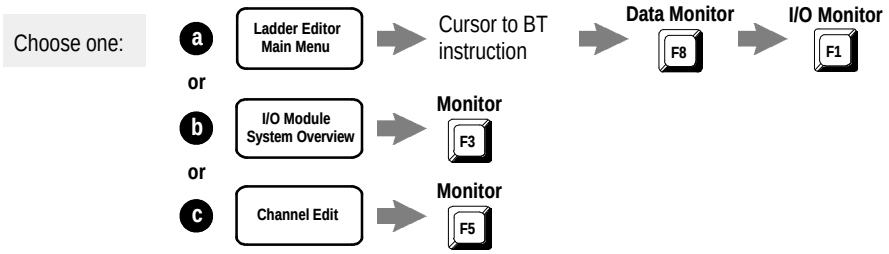

```
1794 IE8/B                      Channel Edit                          R G M: 03 2 1
            Ch    Address         Range          Data     Signal
             1    N7:2          0 20 mA             1    4.000 mA

             2    N7:3          4 20 mA             1    4.000 mA

             3    N7:4          4 20 mA             1    4.000 mA

             4    N7:5          4 20 mA             1    4.000 mA

             5    N7:6          4 20 mA             1    4.000 mA

             6    N7:7          4 20 mA             1    4.000 mA

             7    N7:8          4 20 mA             1    4.000 mA

             8    N7:9          4 20 mA             1    4.000 mA


Enter a channel number.
>
Rem Prog                                          mod 1 of 1      Offline:HCO_310
Change    I/O          Delete  Monitor BT Data Display                 Accept
 Mode   Ovrview                        Tables  Symbols
  F1      F2            F4      F5      F6      F7                      F10
```

Field:	Valid Values:
Channel	Displays the index number of a valid channel.
Address	Displays the address of the channel data.
Range	Press [F9] Toggle to select the desired range for the channel.
Data	Displays the data value reported by the module for the channel.
Signal	Displays the data scaled to a selected range.

Monitoring 1794-IE8 Series A and Series B

Use the monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1794-IE8



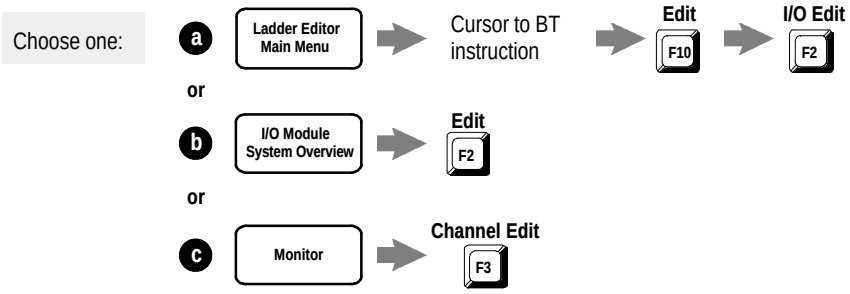

```
1794 IE8/B                          Monitor                          R G M: 03 2 1


                    Write BT        Read BT
     Control File :  N7:1            N7:1        Ok
        Data File :  N7:2            N7:2
           Length :  1               1

       Ch     Address          Range          Data      Signal
       1      N7:2             4 20 mA           1      4.000 mA
       2      N7:3             4 20 mA           1      4.000 mA
       3      N7:4             4 20 mA           1      4.000 mA
       4      N7:5             4 20 mA           1      4.000 mA
       5      N7:6             4 20 mA           1      4.000 mA
       6      N7:7             4 20 mA           1      4.000 mA
       7      N7:8             4 20 mA           1      4.000 mA
       8      N7:9             4 20 mA           1      4.000 mA


Press a function key.
>
Rem Prog                                          mod 1 of 1      Offline:HCO_310
Change     I/O   Channel Delete          BT Data Display
 Mode    Ovrview  Edit                   Tables  Symbols
  F1       F2      F3      F4              F6      F7
```

Field:	Displays this Information:
Write BT	Displays control and data file addresses for the write block transfer instruction.
Read BT	Displays control and data file addresses for the read block transfer instruction. If the module detects that the toggle bit is set correctly, Ok is displayed to the right of the Read BT field; if the module detects that the toggle bit is set incorrectly, unconfigured is displayed to the right of the Read BT field.
Channel	Displays the index number of a valid channel.
Address	Displays the logical address of the value in the Data field.
Range	Displays the current input/output channel voltage/milliamp range.
Data	Displays online data from the module. The data is read from the modules BTR data file.
Signal	Displays the channel data scaled to the selected range. If the module detects that the circuit to the channel is open, wire-off is displayed to the right of the Signal field.

Configuring 1794-IR8 Series A

To configure a 1794-IR8 series A Flex I/O module, follow the steps below.

Channel Edit Screen 1794-IR8



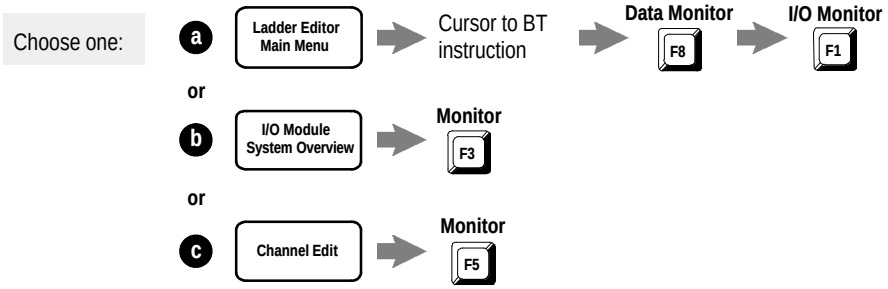

```
1794 IR8/A                    Channel Edit                      R G M: 03 2 1
      Calibration          : OFFSET       Calibration Clock   : STOP

      First Notch Frequency : 10 Hz

      Module Data Type      : DEGREES CENTIGRADE


   Ch  CAL   RTD Type                    Ch  CAL    RTD Type
   0         resistance                  4          resistance

   1         resistance                  5          resistance

   2         resistance                  6          resistance

   3         resistance                  7          resistance



Press (F9) to select calibration type
>
Rem Prog                                      mod 1 of 1      File FLEX_A
Change    I/O                      Monitor BT Data                Toggle  Accept
 Mode   Ovrview                          Tables
  F1      F2                          F5      F6                   F9       F10
```

Field:	Valid Values:
Calibration	Press [F9] Toggle to select between OFFSET and GAIN.
Calibration Clock	Press [F9] Toggle to select between STOP and START.
First Notch Frequency	Displays the first notch frequency in Hz. Press [F9] Toggle to select among 10 Hz, 25 Hz, 50 Hz, 60 Hz, 100 Hz, 250 Hz, 500 Hz, and 1000 Hz. The default is 10 Hz.
Module Data Type	Press [F9] Toggle to select among DEGREES CENTIGRADE, DEGREES FAHRENHEIT, BIPOLAR (between 32768 and +32768), and UNIPOLAR (between 0 and 65535).
Channel	Displays the index number of a valid channel.
CAL	Press [F9] Toggle to indicate if the channel is calibrated.
RTD Type	Press [F9] Toggle to select among resistance, no sensor, 100 ohm pt. (0.00385), 100 ohm pt. (0.003916), 200 ohm pt., 500 ohm pt., 10 ohm copper, 120 ohm nickel, 100 ohm nickel, 250 ohm nickel, 500 ohm nickel, and Module Data Time Stamp. The default is resistance.

Monitoring 1794-IR8 Series A

Use the monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1794-IR8




```
1794 IR8/A                          Monitor                          R G M: 03 2 1

       First Notch Frequency: 10 Hz        Calibration Clock: STOP
                                                 Calibration: OFFSET

   Ch  Value     RTD Type                  Ch  Value     RTD Type
   0  <    0  C  resistance                 4  >    0  C  resistance

   1  <    0  C  resistance                 5  >    0  C  resistance

   2  <    0  C  resistance                 6  >    0  C  resistance

   3  <    0  C  resistance                 7  >    0  C  resistance

   UNCONFIGURED INVALID CALIBRATION        Ok
   CALIBRATION COMPLETE                    INVALID RTD
   REFERENCE SIGNAL OUT OF RANGE



Press a function key.
>
Rem Prog                                          mod 1 of 1          File FLEX_A
Change     I/O    Channel                  BT Data
 Mode    Ovrview  Edit                     Tables
  F1       F2       F3                       F6
```

Field:	Valid Values:
First Notch Frequency	Displays the first notch frequency in Hz. Valid values are 10 Hz, 25 Hz, 50 Hz, 60 Hz, 100 Hz, 250 Hz, 500 Hz, and 1000 Hz. The default is 10 Hz.
Calibration Clock	Valid values are STOP and START.
Calibration	Valid values are OFFSET and GAIN.
Channel	Displays the index number of a valid channel. Entries to the right of the Channel field indicate the range bit setting: < Underrange bit is set. > Overrange bit is set.
Value	Displays the input data value for the channel (between 32767 and +32768). Entries displayed to the right of the Value field indicate the module data type: C Degrees Centigrade F Degrees Fahrenheit Bi Bipolar Un Unipolar
RTD Type	Valid values are resistance, no sensor, 100 ohm pt. (0.00385), 100 ohm pt. (0.003916), 200 ohm pt., 500 ohm pt., 10 ohm copper, 120 ohm nickel, 100 ohm nickel, 250 ohm nickel, 500 ohm nickel, and Module Data Time Stamp. The default is resistance.

Note

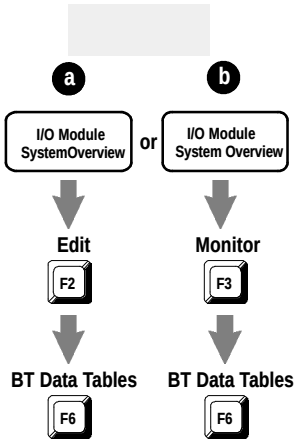
The following messages may be displayed at the bottom of the 1794-IR8 series A Monitor screen when the appropriate bit is set on the module data table:

- *Unconfigured (power up bit)*
- *Invalid Calibration (calibration bit)*
- *Reference Signal Out of Range (reference signal bit)*
- *Invalid RTD (invalid RTD bit)*
- *Calibration Complete (calibration done bit)*

For more information on these messages, see the 8 Input RTD Module User Manual.

Displaying Block Transfer Data for 1794-IR8 Series A Modules

Use the Block Transfer Data screen to display an image of the processor data tables for a 1794-IR8 series A module without returning to the ladder editor to use the data monitor function. Follow the steps on the left.



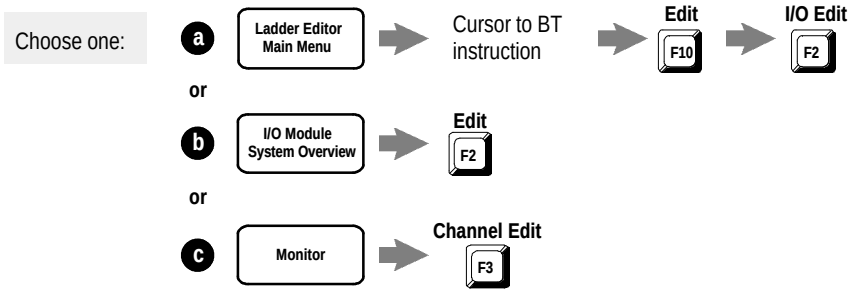

```
1771 IR8/A                Block Transfer Data                R G M: 0 0 1


                 WRITE DATA

   N15:0           0      0      0      0

                 READ DATA

   N17:0           0      0      0      0      0      0      0

   N17:7           0      0      0      0      0


Press  a function key.

Rem Prog                                          mod 1 of 1      File FLEX_A
Change     I/O   Channel          Monitor Change  Display
 Mode    Ovrview   Edit                    Radix  Symbols
  F1       F2      F3               F5      F6      F7
```

You cannot edit the information on this screen.

Configuring 1794-IT8 Series A

To configure a 1794-IT8 series A Flex I/O module, follow the steps below.

Channel Edit Screen 1794-IT8



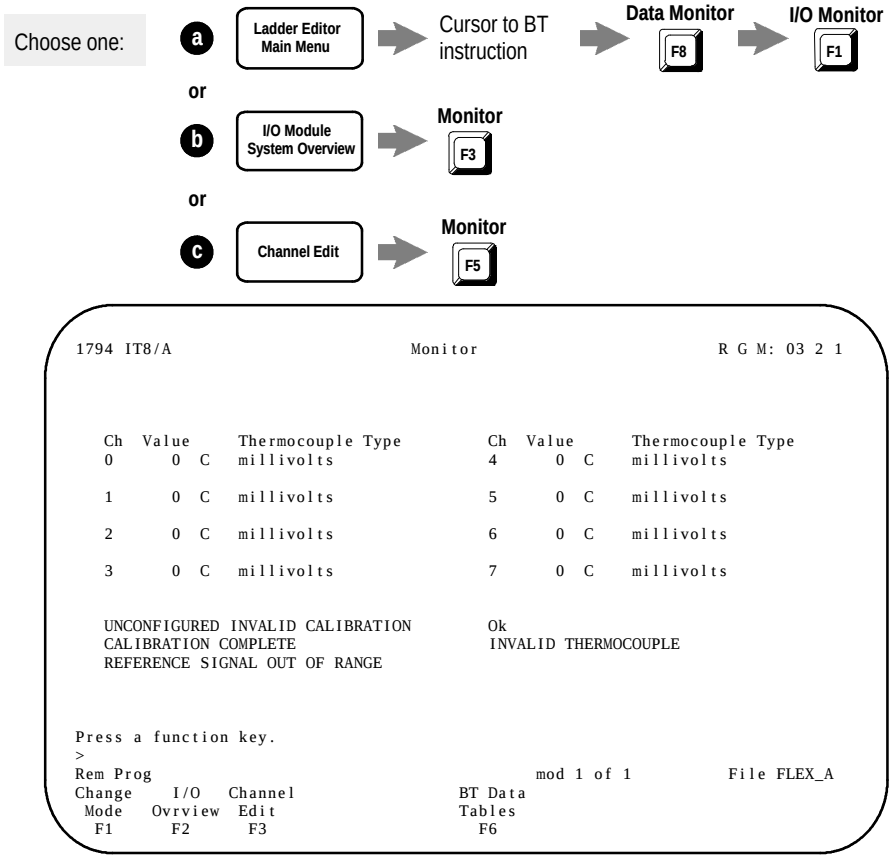

```
1794 IT8/A                    Channel Edit                      R G M: 03 2 1
      Calibration          : OFFSET       Calibration Clock   : STOP

      First Notch Frequency : 10 Hz

      Module Data Type      : DEGREES CENTIGRADE


   Ch  CAL   Thermocouple Type            Ch  CAL    Thermocouple Type
   0         millivolts                   4          millivolts

   1         millivolts                   5          millivolts

   2         millivolts                   6          millivolts

   3         millivolts                   7          millivolts



Press (F9) to select calibration type
>
Rem Prog                                      mod 1 of 1      File FLEX_A
Change    I/O                    Monitor BT Data                Toggle  Accept
 Mode   Ovrview                         Tables
  F1      F2                      F5      F6                     F9       F10
```

Field:	Valid Values:
Calibration	Press [F9] Toggle to select between OFFSET and GAIN.
Calibration Clock	Press [F9] Toggle to select between STOP and START.
First Notch Frequency	Displays the first notch frequency in Hz. Press [F9] Toggle to select among 10 Hz, 25 Hz, 50 Hz, 60 Hz, 100 Hz, 250 Hz, 500 Hz, and 1000 Hz. The default is 10 Hz.
Module Data Type	Press [F9] Toggle to select among DEGREES CENTIGRADE, DEGREES FAHRENHEIT, BIPOLAR (between 32768 and +32768), and UNIPOLAR (between 0 and 65535).
Channel	Displays the index number of a valid channel.
CAL	Press [F9] Toggle to indicate if the channel is calibrated.
Thermocouple Type	Press [F9] Toggle to select among millivolts, B, E, J, K, R, S, T, C, N, Module Data Time Stamp, Cold Junction Temp 0 3, Cold Junction Temp 4 7, and No Sensor. The default is millivolts.

Monitoring 1794-IT8 Series A

Use the monitor screen to check and verify the configuration data. Follow the steps below.

Monitor Screen 1794-IT8



Field:	Valid Values:
Channel	Displays the index number of a valid channel. Entries to the right of the Channel field indicate the range bit setting: < Underrange bit is set. > Overrange bit is set.
Value	Displays the input data value for the channel (between 32767 and +32768). Entries displayed to the right of the Value field indicate the module data type: C Degrees Centigrade F Degrees Fahrenheit Bi Bipolar Un Unipolar
Thermocouple Type	Displays the thermocouple type. Valid values are millivolts, B, E, J, K, R, S, T, C, N, Module Data Time Stamp, Cold Junction Temp 0 3, Cold Junction Temp 4 7, and No Sensor. The default is millivolts.

Note

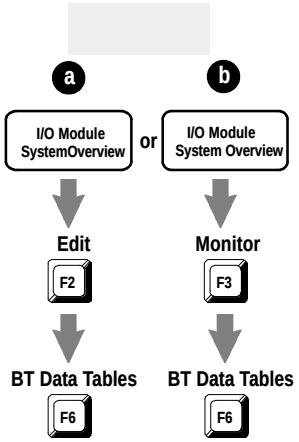
The following messages may be displayed at the bottom of the 1794-IT8 series A Monitor screen when the appropriate bit is set on the module data table:

- *Unconfigured (power up bit)*
- *Invalid Calibration (calibration bit)*
- *Reference Signal Out of Range (reference signal bit)*
- *Cold Junction Sensor < 0 Degrees (cold sensor underrange bit)*
- *Cold Junction Sensor > 70 Degrees (cold sensor overrange bit)*
- *Invalid Thermocouple (invalid thermocouple bit)*
- *Calibration Complete (invalid calibration bit)*

For more information on these messages, see the 8 Input Thermocouple Module User Manual.

Displaying Block Transfer Data for 1794-IT8 Series A Modules

Use the Block Transfer Data screen to display an image of the processor data tables for a 1794-IT8 series A module without returning to the ladder editor to use the data monitor function. Follow the steps on the left.



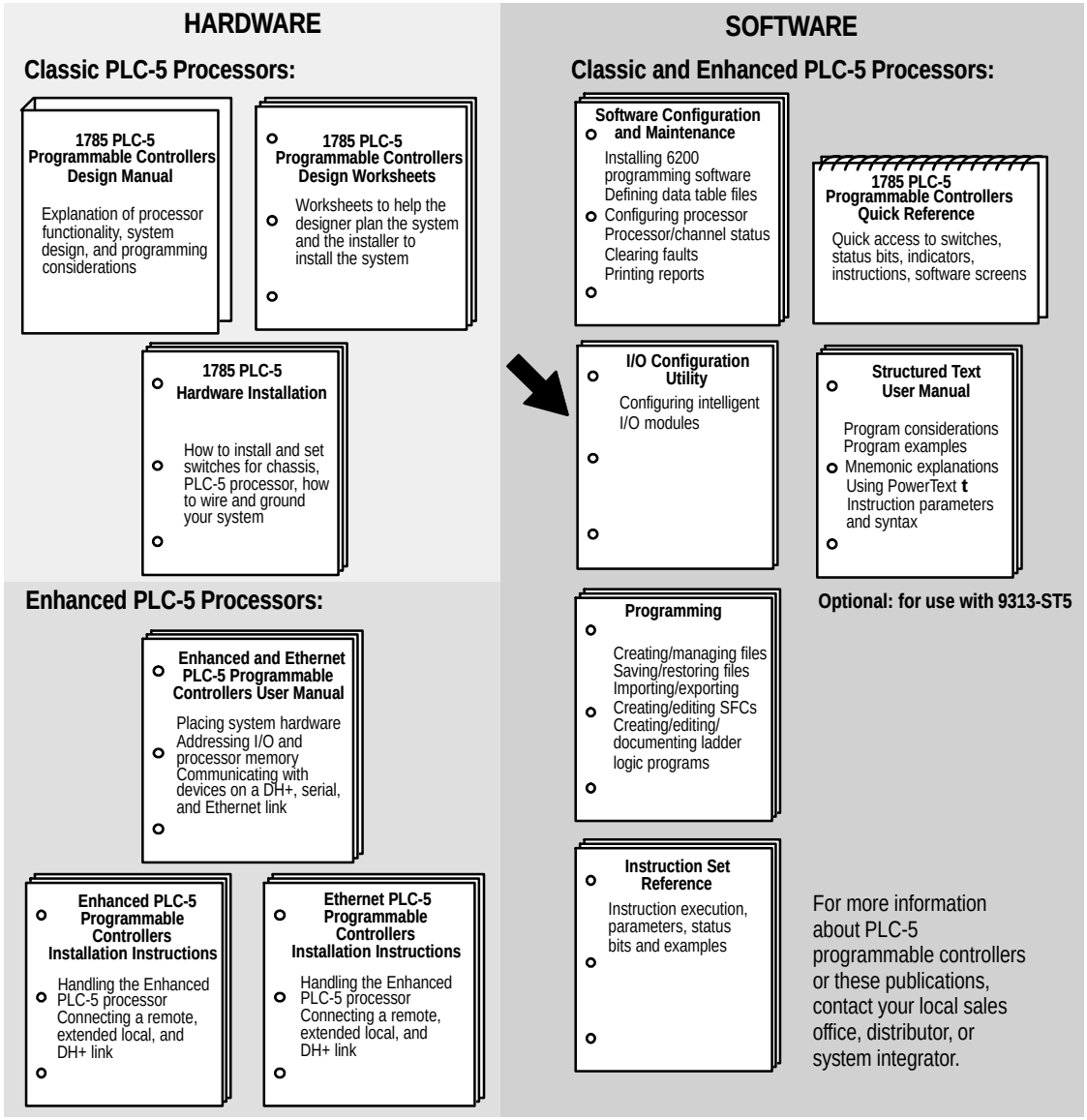

```
1771 IT8/A                  Block Transfer Data                    R G M: 0 0 1

                WRITE DATA

  N15:0           0      0      0      0

                READ DATA

  N17:0           0      0      0      0      0      0      0

  N17:7           0      0      0      0      0



Press  a function key.

Rem Prog                                                mod 1 of 1      File FLEX_A
Change     I/O    Channel          Monitor Change  Display
 Mode    Ovrview    Edit                    Radix  Symbols
  F1       F2       F3               F5       F6      F7
```

You cannot edit the information on this screen.

How to Use Your Documentation

Your PLC-5 programmable controller documentation is organized into manuals according to the tasks you perform. This organization lets you easily find the information you want without reading through information that is not related to your current task. The arrow points to the book you are currently using.

Figure 1
PLC-5 Programmable Controller Documentation Library


HARDWARE
Classic PLC-5 Processors:
1785 PLC-5 Programmable Controllers Design Manual
Explanation of processor functionality, system design, and programming considerations
1785 PLC-5 Programmable Controllers Design Worksheets
Worksheets to help the designer plan the system and the installer to install the system
1785 PLC-5 Hardware Installation
How to install and set switches for chassis, PLC-5 processor, how to wire and ground your system
Enhanced PLC-5 Processors:
Enhanced and Ethernet PLC-5 Programmable Controllers User Manual
Placing system hardware
Addressing I/O and processor memory
Communicating with devices on a DH+, serial, and Ethernet link
Enhanced PLC-5 Programmable Controllers Installation Instructions
Handling the Enhanced PLC-5 processor
Connecting a remote, extended local, and DH+ link
Ethernet PLC-5 Programmable Controllers Installation Instructions
Handling the Enhanced PLC-5 processor
Connecting a remote, extended local, and DH+ link
SOFTWARE
Classic and Enhanced PLC-5 Processors:
Software Configuration and Maintenance
Installing 6200 programming software
Defining data table files
Configuring processor
Processor/channel status
Clearing faults
Printing reports
1785 PLC-5 Programmable Controllers Quick Reference
Quick access to switches, status bits, indicators, instructions, software screens
I/O Configuration Utility
Configuring intelligent I/O modules
Structured Text User Manual
Program considerations
Program examples
Mnemonic explanations
Using PowerText t
Instruction parameters and syntax
Optional: for use with 9313-ST5
Programming
Creating/managing files
Saving/restoring files
Importing/exporting
Creating/editing SFCs
Creating/editing/ documenting ladder logic programs
Instruction Set Reference
Instruction execution, parameters, status bits and examples
For more information about PLC-5 programmable controllers or these publications, contact your local sales office, distributor, or system integrator.

Where to Start

To use 6200 programming software:

- If you are a new user of a Classic PLC-5 processor, use the Hardware Installation Manual to make sure your PLC-5 system is correctly installed; then see the Design Manual and the Design Worksheets for programming guidelines for your PLC-5 system.
- If you are a new user of an Enhanced PLC-5 processor, use the Enhanced PLC-5 Programmable Controllers Installation Instructions or the Ethernet PLC-5 Programmable Controllers Installation Instructions to make sure your PLC-5 system is correctly installed; then see the Enhanced and Ethernet PLC-5 Programmable Controllers User Manual for programming guidelines for your PLC-5 system.
- For Classic PLC-5 and Enhanced PLC-5 processors, start with the Software Configuration and Maintenance manual to learn how to get your software running. Use the remaining manuals in Figure 1 that are designated for your type of processor to plan, create, and test your programs.
- After your system is up and running, use the Quick Reference manual for help in maintaining your system.

If you are already familiar with 6200 programming software, you may only need the Instruction Set Reference manual or the Structured Text User Manual.

Conventions

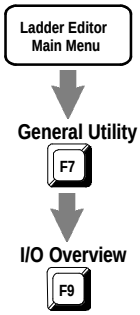
This manual uses the following conventions to describe how to enter information:

- Unless otherwise stated:

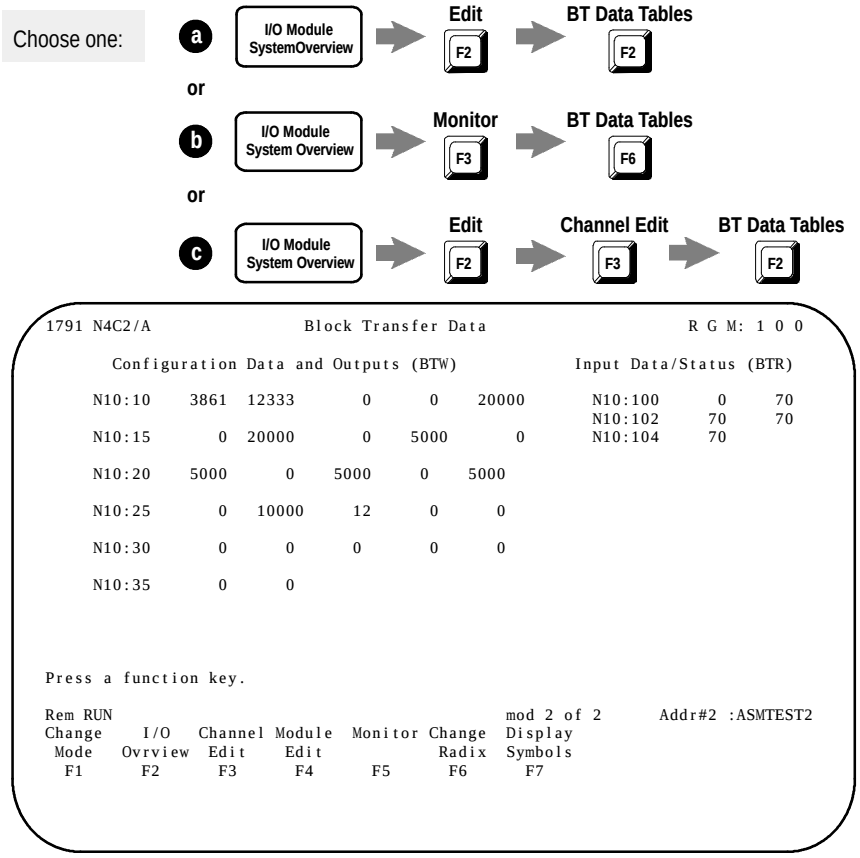
References to:	Include these Allen-Bradley Processors:
Classic PLC-5 processors	PLC-5/10 , -5/12 , -5/15 , -5/25 , and -5/VME processors.
Enhanced PLC-5 processors	PLC-5/11 , -5/20 , -5/30 , -5/40 , -5/40L , -5/60 , -5/60L , and -5/80 processors. **Note:** Unless otherwise specified, Enhanced PLC-5 processors include Ethernet PLC-5, ControlNet PLC-5, Protected PLC-5 and VME PLC-5 processors.
Ethernet PLC-5 processors	PLC-5/20E , -5/40E , and -5/80E processors.
ControlNet PLC-5 processors	PLC-5/20C , -5/40C , -5/60C , and -5/80C processors.
Protected PLC-5 processors [1]	PLC-5/26 , -5/46 , and -5/86 processors.
VME PLC-5 processors	PLC-5/V30 , -5/V40 , -5/V40L , and -5/V80 processors. See the PLC-5/VME VMEbus Programmable Controllers User Manual for more information.

[1] Protected PLC-5 processors alone do not ensure PLC-5 system security. System security is a combination of the Protected PLC-5 processor, the software, and your application expertise.

- Pictures of keys and/or screens represent actual keys that you press or screens that you see. For example, in the procedure for accessing the I/O Module System Overview screen, you see:




```
                        I/O Module System Overview

  R G M   Cat.No./Ser.     BTW data        BTR data       BTW ctrl    BTR ctrl

   1 0 0  1400 PD/A        N10:6     43     N16:6      43    N10:1       N16:1

   0 0 0  1771 IFE/A       N10:50    37     N20:50     20    N10:0       N20:0
   0 0 1  1771 OFE/A       N50:50    13     N60:50      5    N50:0       N60:0
   0 1 0  1791 N4C2/A      N30:50    27     N40:50      5    N30:0       N40:0

   1 0 0  N Series/A       N70:50    59     N80:50     28    N70:0       N80:0




Use keys to position cursor, then press a function key.

Rem Prog                                          mod 1 of 1      Offline:  START1
Change   Edit   Monitor Delete            Add New Display  Copy   Change
 Mode                                     Module  Symbols        Display
  F1      F2      F3      F4               F6      F7      F8      F9
```



In the previous example, you can get to the screen shown above, the Block Transfer Data screen, by any of the three lettered paths. You would probably choose path **a** if you wanted to get to the Block Transfer Data screen from an edit screen, path **b** if you wanted to get to this screen from a monitor screen, or path **c** if you wanted to get to this screen from a channel edit screen.

- Words in square brackets represent actual keys that you press:
  [Enter] or **[F1]** **Online Programming/Documentation**
- Words that describe information that you have to provide are shown in italics. For example, if you have to type a file name, this is shown as: *filename*
- Messages and prompts that the terminal displays are shown as:
  Press a function key

Using the Index

At the back of each software manual, there is a master index for the complete software documentation set. The page reference for the item you are looking for appears in this format:

data file
addressing: *Config/Maint* 9-1
creating: *Config/Maint* 10-2

where the name of the manual that the entry can be found in is in *italics*, followed by the page reference.

For example, the entry for data file addressing (*Config/Maint*) is in the Software Configuration and Maintenance manual. You would go to the Software Configuration and Maintenance manual, and then find the page number.

Master Index

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Customer Support

If you need additional assistance in using your software, Allen-Bradley offers telephone and on-site product support at Customer Support Centers worldwide.

For technical assistance on the telephone, first contact your local sales office, distributor, or system integrator. If additional assistance is needed, then contact your local Customer Support Center or contact System Support Services.

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If you have a SupportPlus agreement or your software is under warranty, you can contact System Support Services at: 1-800-289-2279. Have your support contract or software registration number available.

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For assistance that requires on-site support, contact your local office, distributor, or system integrator. During non-office hours, contact your local Customer Support Center.

Summary of Changes

The table below summarizes the changes that have been made to the I/O Configuration Utility manual since the last printing:

For this New Information:	See Chapter:
ControlNet I/O transfer	throughout
1771-IFE/B and -IFE/C	2
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To help you find new and updated information in this release of the manual, we have included change bars as shown to the right of this paragraph.